Vol. 1043 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

June 26, 1984

U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

June 26, 1984 Volume 1043 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1042 O.G. 45 on May 15, 1984.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Feb. 14, 1984 and was announced in the *Official Gazette* at 1039 O.G. 142 on Feb. 21, 1984.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1984 and were announced in the *Official Gazette* at 1037 O.G. 12 on Dec. 13, 1983.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
· No corresponding prior U.S. national application filed	500.00
· Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
· All cases	620.00
International Fees	
Basic fee (first 30 pages)	295.00
Basic Supplemental fee (for each page over 30)	6.00
Designation fee (for each national or regional office)	70.00

GERALD J. MOSSINGHOFF,
Apr. 13, 1984. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,976,995, Re. S.N. 568,549, Filed Jan. 1, 1984, Cl. 340/825.44, PRECESSING DISPLAY PAGER, George Sebestyen, et al., Owner of Record: *Sanders Associates, Inc., Nashua, N.H.,* Attorney or Agent: Louis Etlinger, Ex. Gp.: 234

4,213,092, Re. S.N. 485,983, Filed Sept. 12, 1983, Cl. 324/319, NMR SPECTROMETER WITH SUPERCONDUCTING COIL HAVING RECTANGULAR CROSS-SECTION WIRE, George D. Kneip, Jr., Owner of Record: *Varian Associates, Inc., Palo Alto, Calif.,* Attorney or Agent: Stanley Z. Cole, et al., Ex. Gp.: 324

4,320,855, Re. S.N. 586,660, Filed Mar. 6, 1984, Cl. 222/56, WEIGH FEEDING APPARATUS, Ronald J. Ricciardi, et al., Owner of Record: *Acrison, Inc., Moonachie, N.J.,* Attorney or Agent: Charles W. Bradley, et al., Ex. Gp.: 311

4,320,855, Re. S.N. 586,899, Filed Mar. 6, 1984, Cl. 222/56, WEIGH FEEDING APPARATUS, Ronald J. Ricciardi, et al., Owner of Record: *Acrison, Inc., Moonachie, N.J.,* Attorney or Agent: Charles W. Bradley, et al., Ex. Gp.: 313

4,343,667, Re. S.N. 596,026, Filed Apr. 2, 1984, Cl. 156/157, METHOD FOR MAKING AN INDEFINITE LENGTH COMPOSITE SHEET OF VERY LARGE PREDETERMINED WIDTH FROM INDEFINITE LENGTH SHEET STOCK OF RELATIVELY SMALL WIDTH, Jack L. Hollis, Owner of Record: *Carlisle Tire and Rubber Co., Carlisle, Pa.,* Attorney or Agent: Herbert C. Brinkman, et al., Ex. Gp.: 131

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

4,016,892, Reexam. No. 90/000,566, Requested: May 30, 1984, Cl. 132/91, DENTAL FLOSS HOLDER, Ingram S. Chodorow, Owner of Record: *Placontrol, Inc., Elmsford, N.Y.,* Attorney or Agent: J. David Dainow, Ex. Gp.: 332, Requester: Placontrol, Inc., Elmsford, N.Y.

4,075,236, Reexam. No. 90/000,562, Requested: May 24, 1984, Cl. 260/453, CONTINUOUS MANUFACTURE OF PEROXYESTERS, Uday D. Wagle, et al., Owner of Record: *Penwalt Corp., Philadelphia, Pa.,* Attorney or Agent: David Edwards, Ex. Gp.: 120, Requester: Owner

4,219,675, Reexam. No. 90/000,563, Requested: May 24, 1984, Cl. 568/563.000, BATCH PROCESS FOR MANUFACTURING AND PURIFYING LIQUID ORGANIC PEROXIDE BY DISTILLATION, Venkatram Ramdas, et al., Owner of Record: *Penwalt Corp., Philadelphia, Pa.,* Attorney or Agent: David Edwards, Ex. Gp.: 120, Requester: Owner

4,261,598, Reexam. No. 90/000,565, Requested: May 30, 1984, Cl. 285/64, CONCRETE FLOOR EMBEDDED COUPLING FOR PLASTIC PIPE, Kenneth R. Cornwall, Owner of Record: *Kenneth R. Cornwall, Atlanta, Ga.,* Attorney or Agent: Ian C. McLeod, Ex. Gp.: 350, Requester: U.S. Construction Mftg., Inc., N. Lauderdale, Fla.

4,294,086, Reexam. No. 90/000,556, Requested: May 18, 1984, Cl. 66/121, LATCH NEEDLE FOR KNITTING MACHINES, Harald Mayer, et al., Owner of Record: *Thedor Groz & Sohne & Ernst Beckert, Nadelfabrik Commandit, Gesellschaft, Albstadt/Ebingen, Germany,* Attorney or Agent: Allison Collard, Ex. Gp.: 120 Requester: Monarch Knitting Machinery Corp., Glendale, N.Y.

4,436,519, Reexam. No. 90/000,564, Requested: May 29, 1984, Cl. 604/175, REMOVABLE HEMOSTASIS VALVE, William J. O'Neill, Owner of Record: *Argon Medical Corp., Athens, Tex.,* Attorney or Agent: Lawrence S. Levinson, Ex. Gp.: 336, Requester: Vernay Laboratories, Inc., Yellow Springs, Ohio

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Erratum

In the "Index of Registrants" section of the Trademark Official Gazette of Mar. 6, 1984, the renewal appli-

cant's city and state for Registration No. 750,003 was incorrectly indentified as Niles, Mich.

The renewal applicant's city and state as corrected is Brecksville, Ohio.

MARK M. NEWMAN,
May 17, 1984. *Director Trademark*
Examining Operation.

Errata

The following registrations were inadvertently omitted from the "Trademark Registrations Cancelled, Section 18" section of the Trademark Official Gazette of Aug. 30, 1983:

947,144. CARX AND DESIGN. Int. Cl. 12. Reg. 11-14-72.

968,627. EXXON AND DESIGN. Int. Cl. 11. Reg. 09-18-73.

Accordingly, these registrations were cancelled effective Aug. 30, 1983.

MARK M. NEWMAN,
May 17, 1984. *Director Trademark*
Examining Operation.

Service by Publication

A petition to cancel each of the registrations identified below having been filed, and the notice of such proceedings sent by certified mail to each registrant at the last known address having been returned by the Postal Service as undeliverable, notice is hereby given that unless the registrants listed herein, their assigns or legal representatives, shall enter an appearance within thirty days from the date of this publication, the cancellation will be proceeded with as in the case of default.

Richard Santos, dba Santos Shrimp, Malibu, Calif., Reg. No. 1,231,247, for the mark "SANTOS BRAND SHRIMP" and design, Canc. No. 14,182.

Car Placement Services, Inc., Pikesville, Md., Reg. No. 1,133,294, for the mark "SHOW & SELL", Canc. No. 14,237.

ERMA S. BROWN,
Deputy Clerk of the
Trademark Trial and
Appeal Board.
For MARGARET M. LAURENCE,
Assistant Commissioner
for Trademarks.

Status of PTO Services

The following is an update of the status of PTO services for May 1984:

Service Item	FY 1984 Performance Goal (Calendar Days)	Actual	Comment
Filing Receipts:			
Patents	22	23	
Trademarks	30	59	Reduced by 16 days.
Patent/Trademark Copies:			
Window Coupons	5	94% within 5 days	
Mail Coupons	29	99% within 29 days*	
Letter Orders	34	99% within 34 days*	
Date of oldest unfilled order		Apr. 26, 1984	
Certified Copies:			
Trademark Registrations	30	14	
Applications-As-Filed	20	99% within 15 days	
File-Wrapper/Contents	N/A	99% within 7 days	
Walk-up Certification	1	99% within 1 day	
Trademark Search Library:			
Filing Drawings	21	36	Delay is temporary due to a special work project.
Filing Reg. Certificates	3	3	
Assignments:			
Patents	25	18	
Trademarks	25	14	
Avg. Days from Issue Fee Payment to Issue Date	90-100	87	
Patent Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 1 day late	
Patent Grants Mailed	Issue Date	On schedule	
Patent Copies Available	Issue Date	On schedule	
Trademark Copies Available	Issue Date	Avg. 1 day late	
Trademark Official Gazette:			
In Bookstore	Issue Date	On schedule	
Mailed	Issue Date	Avg. 2 days early	
Trademark Regs. Mailed	Issue Date	Avg. 4 days late	

*Figures include mail processing and delivery time.

FILE HISTORY RETRIEVAL — SUITLAND FILES

The Federal Records Center in Suitland, Md. has recently announced that due to staffing limitations, they can no longer escort PTO employees who are conducting special searches for missing file histories. The PTO must now rely solely on Records Center personnel to locate all files. In addition, the Records Center cannot commit to the timely refiling of records returned by the PTO.

A first step in our effort to lessen the impact of this change will be that the PTO File Repository will hold Suitland files for at least three weeks after they are returned by a requestor. This will provide for quicker access to files that are of interest to multiple requestors. It will also enable the PTO to return files to the Suitland facility in bulk, thus enhancing the possibility of a more prompt refile.

PTO CLERICAL AWARDS PROGRAM

The PTO has established a special cash award program for clerical employees, effective Apr. 1. The Clerical Employee of the Year will receive $1,000. Cash awards of $100 will be presented to a maximum of five recipients of the Clerical Employee of the Quarter award. Through this award system, we will demonstrate clearly that the Office appreciates the dedication and contributions of its clerical employees and will publicly bestow on them the honor and respect they deserve.

June 5, 1984.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

PATENT NOTICES

Certificates of Correction for the Week of June 26, 1984

Re. 31,460	4,399,380	4,423,787	4,433,767
Re. 31,551	4,405,339	4,423,856	4,434,029
D. 272,292	4,405,710	4,424,138	4,434,032
4,073,820	4,408,231	4,425,049	4,434,078
4,276,785	4,409,360	4,425,759	4,434,272
4,321,112	4,409,677	4,427,553	4,434,750
4,352,686	4,410,768	4,427,674	4,435,117
4,354,487	4,411,255	4,427,766	4,435,275
4,359,564	4,411,710	4,428,536	4,435,323
4,359,606	4,412,285	4,430,299	4,436,009
4,359,630	4,415,256	4,430,308	4,436,832
4,368,755	4,415,579	4,430,315	4,437,100
4,370,709	4,415,715	4,430,855	4,437,236
4,381,599	4,417,158	4,430,884	4,437,626
4,381,689	4,418,002	4,430,948	4,437,696
4,383,218	4,418,399	4,431,008	4,438,239
4,387,139	4,418,627	4,431,210	4,438,756
4,388,365	4,419,179	4,431,428	4,439,038
4,392,120	4,420,761	4,431,518	4,439,323
4,393,056	4,422,956	4,432,890	4,441,006
4,394,842	4,423,193	4,433,637	4,441,049

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7140
California	Los Angeles Public L ibrary	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis—Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6670
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390, Ext. 391
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF May 26, 1984

PATENT EXAMINING GROUPS	Actual Filing Date of Action New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	4-08-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	9-29-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	9-30-82
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-21-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director	3-22-82
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	8-25-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	9-24-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	7-19-82
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	3-11-81
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	1-07-82
DESIGN, GROUP 290—K. L. CAGE, Director	2-01-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	8-03-82
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	6-10-82
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	6-08-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	5-14-82
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	10-15-81

Expiration of patents: The patents within the range of numbers indicated below expire during May 1984, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents . . . . . Numbers 3,316,556 to 3,323,133, inclusive

Plant Patents . . . . . Numbers 2,734 to 2,745 inclusive

REISSUES

JUNE 26, 1984

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,610
MODIFYING MORTARS OF INORGANIC BINDING AGENTS WITH ALKYLATED SULPHONATED PHENOL-FORMALDEHYDE CONDENSATION PRODUCT

Kurt Schaupp; Gunther Reitz, both of Cologne, and Günther Boehmke, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Original No. 4,330,334, dated May 18, 1982, Ser. No. 175,802, Aug. 6, 1980. Application for reissue Sep. 27, 1982, Ser. No. 424,682

Claims priority, application Fed. Rep. of Germany, Sep. 4, 1979, 2935719

Int. Cl.³ C04B *7/35*

U.S. Cl. 106—90 **17 Claims**

1. In a mortar comprising an inorganic binder, water and a sulphonated phenol condensation product modifier therefor, the improvement wherein said condensation product comprises a formaldehyde condensation product of a phenol wherein [at least about 40%] *about 60% to 90%* of the phenolic OH groups are etherified with an alkylating agent, the condensation product being present in about 0.05 to 5% by weight of the binder.

Re. 31,611
LUBRICANT COMPOSITIONS

Paul Wainwright, Chelmsford; Michael J. Green, Wetherby, and Barry S. Charlston, Castleford, all of England, assignors to Rocol Limited, Swillington, England

Original No. 4,159,252, dated Jun. 26, 1979, Ser. No. 893,609, Apr. 4, 1978. Application for reissue Apr. 28, 1981, Ser. No. 258,448

Claims priority, application United Kingdom, Apr. 6, 1977, 14590/77; Japan, Jan. 17, 1978, 53-2843

Int. Cl.³ C10M *1/10, 3/02, 5/02, 7/02*

U.S. Cl. 252—25 **19 Claims**

1. A lubricant composition for use [alone or] in a lubricating base, comprising a finely divided carbonate of a Group IIA metal and a halogenated organic lubricant, *the carbonate being present in a major proportion with respect to the halogenated organic lubricant.*

Re. 31,612
CCD INPUT CIRCUITS

Donald J. Sauer, Plainsboro, N.J., assignor to RCA Corporation, New York, N.Y.

Original No. 4,139,784, dated Feb. 13, 1979, Ser. No. 821,318, Aug. 2, 1977. Application for reissue Jun. 1, 1981, Ser. No. 269,520

Int. Cl.³ G11C *19/28;* H01L *29/78;* H03K *3/42*

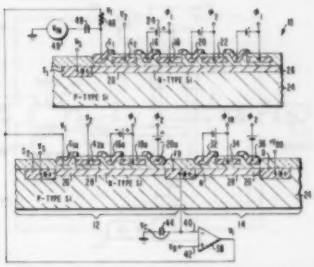
U.S. Cl. 307—221 D **29 Claims**

1. In a charge-coupled circuit which includes a semi-conductor substrate of given conductivity type, a plurality of electrode means insulated from the substrate responsive to applied voltages for the storage and propagation of charge in said substrate, and an electrically floating region in the substrate of different conductivity type than the substrate, in combination:

means for supplying a controllable amount of charge to said region *in accordance with a continuous function of the level of a direct voltage applied thereto;*

means including a number of said electrode means for removing from said region, during each of a plurality of spaced time intervals, a fixed quantity of charge, that is, an amount of charge which is of substantially the same magnitude from one time interval to the next; and

feedback circuit means for adjusting the controllable amount of charge supplied to said region to be equal to the charge removed from that region so as to tend to maintain said floating region at a relatively constant average voltage level, said feedback circuit means including means responsive *solely* to said average voltage level at said floating region for applying [a] *said* direct voltage bias at a level proportional to said average voltage level to said means for supplying a controllable amount of charge.



Re. 31,613
MEASURING TRANSFORMER

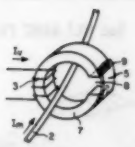
Heinz Lienhard, Zug, and Gernot Schneider, Baar, both of Switzerland, assignors to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Original No. 4,309,655, dated Jan. 5, 1982, Ser. No. 918,446, Jun. 23, 1978. Application for reissue Aug. 6, 1982, Ser. No. 405,859

Claims priority, application Switzerland, Jul. 8, 1977, 8455/77; May 24, 1978, 5644/78

Int. Cl.³ G01R *1/20, 33/00;* H01F *1/00*

U.S. Cl. 324—117 R **12 Claims**



1. A measuring transformer comprising:

a core of magnetizable material having an air gap;

an anisotropic thin film of magnetizable material positioned at said gap, a surface of said film being parallel to a path of magnetic flux bridging said gap;

a measuring conductor for carrying a current to be measured, said conductor being disposed adjacent said core for magnetic coupling therewith; and

a pre-magnetizing winding for carrying an alternating pre-magnetizing current to induce an alternating varying magnetic field which repetitively saturates the material of said film in both directions of saturation, said winding being disposed adjacent said core for magnetic coupling therewith, whereby the point of time of the saturation of said film is dependent on the strength of said current to be measured.

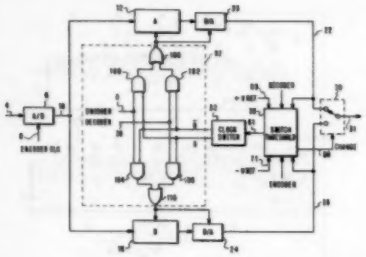
Re. 31,614
DECREASING TIME DURATION OF RECORDED SPEECH

Charles R. Bringol, and Gary F. Snyder, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Original No. 4,228,322, dated Oct. 14, 1980, Ser. No. 227, Jan. 2, 1979. Application for reissue Jun. 21, 1982, Ser. No. 390,740

Int. Cl.³ G10L *1/00*

U.S. Cl. 381—35 **5 Claims**



1. In a system for time compression of prerecorded speech signals which are played back at a rate greater than that at which they were recorded and in which the input speech is loaded alternately into first and second buffers and output from the buffers is alternatively applied to a using device, said system including

means for loading one of said buffers while the other is providing an output to said using device, the improvement comprising:

means for changing the source of output applied to said using device from said fist buffer to said second buffer when the output level of both of said buffers *is substantially equal and* falls within a predetermined range *of a zero crossing.*

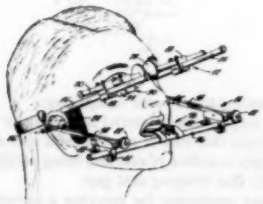
Re. 31,615
JAW MOVEMENT SIMULATION

Robert L. Lee, 22937 Grand Terrace Rd., Colton, Calif. 92324

Original No. 4,034,474, dated Jul. 12, 1977, Ser. No. 485,158, Jul. 1, 1974. Application for reissue Apr. 27, 1979, Ser. No. 34,159

Int. Cl.³ A61C *19/04*

U.S. Cl. 433—73 **43 Claims**



1. Dental apparatus for analyzing or recording jaw movements comprising:

an upper frame having two thin flat rigid recording plates, mounted to be positioned one on either side of a patient's head perpendicular to the horizontal axis of the patient's temporomandibular joints, said plates having a grid formed on their outer surface;

a lower frame affixed to the patient's mandible, said mandibular frame having a pair of side arms one on either side extending alongside but spaced from the patient's face, and means mounted on each of said side arms extending inwardly to engage said grids on the upper recording plates to monitor or record mandibular movements on said grid; and

means removably mounted on said upper frame for providing on said grid a reference line in a plane through said axis and a third point on the upper frame aligned with a point on the patient's face or nose, whereby measurements of said movements may be made in relation to said reference line.

Re. 31,616
CATHODIC ELECTRODEPOSITION COATING COMPOSITIONS CONTAINING DIELS-ALDER ADDUCTS

Ivan H. Tsou, Bloomfield Hills, Mich., assignor to Wyandotte Paint Products, Troy, Mich.

Original No. 4,186,117, dated Jan. 29, 1980, Ser. No. 948,397, Oct. 4, 1978. Division of Ser. No. 859,296, Dec. 12, 1977, Pat. No. 4,148,704. Application for reissue Jan. 27, 1982, Ser. No. 343,040

Int. Cl.³ C09D *3/58, 5/40*

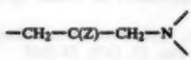
U.S. Cl. 523—414 **8 Claims**

1. An organic coating composition comprising a dispersion, solution or suspension of a coating composition characterized by:

(a) the reaction product of a conjugated fatty acid ester and an acrylic containing monomer; and

(b) Formula A within the molecule, being the reaction product of reacting an amine with an oxirane ring;

wherein Formula A is:



wherein Z is independently selected from the group consisting of hydrogen, hydroxyl, alkoxy of from one to 6 carbon atoms; acyloxy of from one to 6 carbon atoms; (=O), $-OR']_nH$, $-OR']_nOH$, and $-OR'(CH_2OH)]_nOH$; wherein R' is a saturated alkylene of from 2 to 4 carbon atoms and n is a number from 1 to 6.

Re. 31,617
OPTIONALLY SUBSTITUTED 1,2,3,5-TETRAHYDROIMIDEZO(2,1-b)-QUINAZOLIN-2-ONES AND 6(H)-1,2,3,4-TETRAHYDROPYIMIDO(2,1-b)QUINAZOLIN-2-ONES

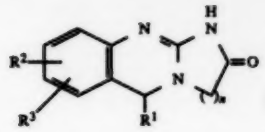
Warren N. Beverung, Jr., Cary, N.C., and Richard A. Partyka, Liverpool, N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Original No. 3,932,407, dated Jan. 13, 1976, Ser. No. 521,306, Nov. 6, 1974. Continuation-in-part of Ser. No. 416,891, Nov. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 396,638, Sep. 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 291,450, Sep. 22, 1972, abandoned, which is a continuation-in-part of Ser. No. 223,723, Feb. 4, 1972, abandoned. Application for reissue Sep. 22, 1982, Ser. No. 421,501

Int. Cl.³ C07D *487/04*

U.S. Cl. 544—250 **25 Claims**

1. The compound having the formula



I

in which R^1 is H, phenyl or (lower)alkyl, R^2 and R^3 when different are hydrogen, chloro, bromo, fluoro, CF_3, SO_3H, hydroxy, (lower)alkyl or (lower) alkoxy, nitro, amino or phenyl, R^2 and R^3 when alike are hydrogen, bromo, chloro, fluoro, hydroxy, (lower)alkyl of 1 to 3 carbon atoms or (lower-)alkoxy of 1 to 3 carbon atoms, or when taken together R^2 and R^3 are methylenedioxy or the moiety —CH=CH—CH=CH—, and n is an integer of 1 or 2; or a pharmaceutically acceptable acid addition salt thereof.

PLANT PATENTS

GRANTED JUNE 26, 1984

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,249

ROSE PLANT—JACFUN

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Co., Medford, Oreg.

Filed Sep. 23, 1982, Ser. No. 422,484
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—9 1 Claim

1. A new and distinct variety of rose plant of the miniature class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its miniature plant habit, pink flowers with darker reverse side, large prickles and mild fragrance.

5,250

ROSE PLANT—JACROM

William A. Warriner, Tustin, Calif., assignor to Jackson & Perkins Company, Medford, Oreg.

Filed Sep. 29, 1982, Ser. No. 428,316
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—18 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea class, substantially as herein shown and described, characterized particularly as to novelty by the unique combination of its pointed bud of a light orange color, non-blueing in age, on long straight stems, usable as cut flowers.

5,251

PEACH TREE

James F. Doyle, 7685 N. Thompson Ave., Clovis, Calif. 93612

Filed Sep. 28, 1982, Ser. No. 425,563
Int. Cl.[3] A01H *5/03*
U.S. Cl. Plt.—42 1 Claim

1. A new and distinct variety of peach tree characteritized by bearing clingstone fruit which ripens approximately twenty days earlier than fruit of the Nectar Peach Tree (U.S. Plant Pat. No. 86), having superior shipping and keeping qualities; flesh of a white or cream color (10-B-1); skin of cream ground color (17-O-1) overlaid with blush red (3-J-10) to dark red (6-K-9); and large, showy blossoms; and such tree being particularly characterized as to novelty by bearing peaches which, when fully ripe, have flesh which is very firm and non-melting and virtually completely free of color.

PATENTS

GRANTED JUN. 26, 1984

ERRATA

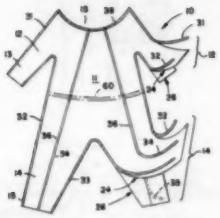
For CLASS	See PATENT NO.
405–186	4,445,718
446–241	4,455,781
446–155	4,455,782
446–071	4,455,783
092–012	4,455,920
604–152	4,456,009
162–272	4,456,066
219–300	4,456,186
242–205	4,456,209
404–007	4,456,407
502–117	4,456,547
429–104	4,456,631

PATENTS

GRANTED JUNE 26, 1984

GENERAL AND MECHANICAL

4,455,683
SELF-ADJUSTING PROTECTIVE GARMENT
Anthony L. Moretti, San Rafael, Calif., assignor to E.D. Bullard Company, Sausalito, Calif.
Filed Mar. 29, 1982, Ser. No. 362,881
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **10 Claims**



1. In an air tight protective garment made of air impervious thin sheet material for use at ground level having a generally tubular torso covering portion with a neck opening and with a pair of generally tubular arm portions and a pair of generally tubular leg portions formed integrally therewith, said neck opening having an air tight head enclosure sealingly affixed about the edge thereof, said pair of arm portions each having a different one of a pair of glove members sealingly fixed to the free end thereof, said pair of leg portions each having a different one of a pair of boot members sealingly fixed to the free end thereof, an air conduit supplying a positive air plenum through a wall of said garment and a one-way air exhaust means provided through a wall of said garment, the improvement comprising a plurality of elastic strip members affixed in an expanded state to the inner surface of said generally tubular torso covering portion and extending longitudinally thereof from said neck opening to said generally tubular leg portions, a plurality of elastic strip members affixed in an expanded state to the inner surface of each of said pair of arm portions and extending longitudinally from said free end thereof to said tubular torso covering portion, and a plurality of elastic strip members affixed in an expanded state to the inner surface of each of said pair of leg portions and extending longitudinally from the free end thereof to said tubular torso covering portion.

4,455,684
SHOULDER PROTECTION DEVICE
Sam E. Johnson, 1519 Westbury Dr., Davison, Mich. 48423
Filed Sep. 7, 1982, Ser. No. 415,607
Int. Cl.³ A41D *13/00*
U.S. Cl. 2—2 **8 Claims**

1. A recoil and shock eliminating device for use in protecting the shoulder of a person operating a rifle or shotgun-type firearm,

said device comprising a body disposed within an exterior flexible fabric cover which is constructed to envelope the body and provide attachment means to facilitate releasably securing the device to an associated garment,

said body consisting solely of a molded polyurethane elastomeric thermoplastic material that is entirely solid so as to have no internal voids in the material, with said material being capable of distorting in response to a recoil force of an operating firearm juxtapositioned thereagainst, and having sufficient structural integrity to prevent the butt of the firearm from bottoming out against the user's shoulder and thereby absorb and eliminate the recoil force and shock of the operating firearm to prevent injury to the operator and reduce operator's fatigue resulting from both single firing and sustained operation of the firearm,

said material having a specific gravity range of approximately 1.02 to approximately 1.03 and having an elongation range of from approximately 300 percent to approximately 1,200 percent.

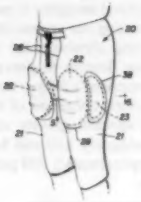
4,455,685
PARTIAL PRESSURE JERKIN
Jean C. Steffler, Downsview; Herman Kaufman, Willowdale; Joseph A. G. Portier, and James A. Firth, both of Toronto, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of National Defence, Ottawa, Canada
Filed Oct. 7, 1981, Ser. No. 309,507
Claims priority, application Canada, Dec. 8, 1980, 366338
Int. Cl.³ A62B *17/00*
U.S. Cl. 2—2.1 A **14 Claims**

1. A partial pressure jerkin comprising an outer garment having a front panel to overlie the chest of torso, a rear panel connected to said front panel and arranged to overlie the spine and back of a torso, head and arm apertures formed in said garment between said front and rear panels, a bladder located within said garment and overlying at least a portion of said front panel, connection means to connect said bladder to a pressurised source, an opening in said rear panel to permit said garment to be placed on said torso and fastening means to secure said opening whereby said bladder may extend in uninterrupted manner across said front panel.

4,455,686
PROTECTIVE LEG PADDING FOR ATHLETIC PANTS
Robert M. Zide, Williamstown, W. Va., assignor to Pro-Line, Inc., Marietta, Ohio
Filed Feb. 17, 1983, Ser. No. 467,213
Int. Cl.³ A41D *13/06*
U.S. Cl. 2—23 **5 Claims**

1. Athletic pants for football players comprising a fabric body portion having legs, a first fabric pocket attached to the interior of each leg in the frontal thigh region, a permanently laterally curved frontal thigh pad held within the first pocket and substantially conforming to the natural lateral curvature of the front of the thigh and spanning substantially the entire front of the thigh to protect it from frontal blows, a second fabric

pocket attached to the interior of each leg adjacent to the vastus lateralis, a side pad having substantially the same thickness as the frontal thigh pad held in the second pocket and covering and protecting the vastus lateralis from angle blows and side blows, the frontal thigh pad and side pad having opposing closely adjacent substantially vertical edge faces which diverge outwardly from the interior faces of said pads



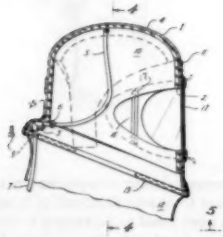
and define with the interior faces substantially square interior vertical corners, said corners being substantially in abutting relationship through the fabric of said pockets to define a substantially vertical hinge axis for said pads, whereby the pads can conform to the natural contours of a wearer's leg in various positions of flexure of the leg substantially without restricting leg flexure.

4,455,687

HEAD COVER AND SAFETY HELMET

Sven O. G. Johansson, Houston, Tex., assignor to Helen Frances Johansson, Houston, Tex.

Filed Apr. 20, 1981, Ser. No. 255,795
Int. Cl.³ A62B *17/04*; A42B *3/00*
U.S. Cl. 2—424 **3 Claims**



1. In a ventilated hood cover and safety helmet, a rigid shell having a liner therein, an air hose in said shell, a plastic foam liner loosely mounted in said shell beneath said air hose, a face opening in said shell, a primary shield over said face opening, secondary shields on said primary shield, a porous collar on said shell having a stiffener therein located below said shell for maintaining an oval shape of the collar in cross section, and a flexible tubular band mounted on said shell engaging the edges of said primary shield and the longitudinal edges of said secondary shields and the said stiffener and band maintaining the said collar and shields detachably mounted on the shell.

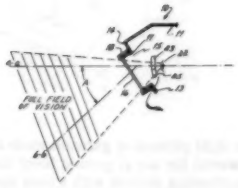
4,455,688

WELDER'S GOGGLES

Boyd L. Poe, 3735 Hermes La., Cincinnati, Ohio 45239

Filed Aug. 5, 1981, Ser. No. 290,365
Int. Cl.³ A61F *9/02*
U.S. Cl. 2—431 **2 Claims**

1. Protective goggles for welders, chippers, and the like, particularly adapted for wearers of corrective bifocal lenses which comprises: a generally tubular shaped protective member; an open end to said tubular member contoured to fit snugly against the face about the eyes of the wearer, said open end having an axis on approximately the same horizontal plane as the axes of the eyes of the wearer when looking straight ahead; a generally planar closed viewing end to said tubular member having at least one viewing aperture, a cylindrical lens holder mounted in said viewing end of said tubular member adjacent said viewing aperture, a replaceable safety lens mounted in said lens holder, said lens holder and said safety



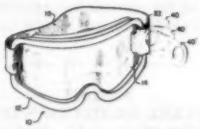
lens having a central axis, said central axis of said lens holder and said safety lens intersecting the axis of the open end of said tubular member at an angle from below it, the degree of the included angle formed by the intersecting axes being predetermined so that the closed viewing end is tilted in relation to the open end such that the wearer of the goggles when using corrective bifocal lenses underneath them will have an unobstructed view through the lower portion of the bifocal lens and through the safety lens.

4,455,689

GOGGLE WITH TEAR OFF TRANSPARENCIES

Wayne E. Boyer, 12118 Poway Rd., Poway, Calif. 92064

Filed Sep. 27, 1982, Ser. No. 423,622
Int. Cl.³ A61F *9/02*
U.S. Cl. 2—434 **14 Claims**



1. An apparatus for removably mounting a plurality of tear off transparencies over the outer side of the lens of goggles having a deformable surrounding frame with a vertical slot extending through one side edge thereof, each transparency having an arm portion which extends from one end thereof, the arm portion having a hole formed therein, comprising:

a bracket having a portion insertable in the slot in the goggle frame and means for retaining the insertable portion in the slot; and

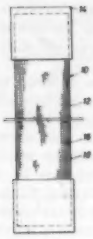
a retaining pin extending outwardly from the bracket and having an enlarged head slightly larger than the hole in the arm portion of the transparency.

4,455,690

STRUCTURE FOR IN VIVO IMPLANATION

Charles A. Homsy, 11526 Raintree Cir., Houston, Tex. 77024

Filed Nov. 6, 1980, Ser. No. 204,529
Int. Cl.³ A61F 1/00
U.S. Cl. 3—1 35 Claims



1. A structure suitable for in vivo implantation in tension applications comprising

a plurality of biocompatible strands,

biocompatible means securing the ends of the strands,

means coating the strand portion between said ends so that such strand portions have sufficient lubricity to be slidable with respect to each other,

biocompatible protection means surrounding a substantial portion of said strands between their secured ends and coacting with the strands to allow spatial adjustment of their positions so that on flexing the strands move to the inside of the bend whereby each strand carries substantially all of its share of the structure loading in all positions of the implanted structure, and

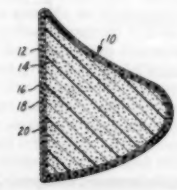
means on the ends of the strands for securing the structure in implanted position.

4,455,691

SILICONE GEL FILLED PROSTHESIS

Peter Van Aken Redinger, and Richard A. Compton, both of Santa Barbara, Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 3, 1979, Ser. No. 81,379
Int. Cl.³ A61F 1/00
U.S. Cl. 3—36 12 Claims



12. A silicone gel-filled silicone rubber article possessing a reduced tendency to exhibit surface-bleed comprising

(A) a flexible container of silicone rubber consisting essentially of a cross-linked gum of polydimethylsiloxane, said container being filled with

(B) a silicone gel composition consisting essentially of a silicone gel of cross-linked polydimethylsiloxane, there being

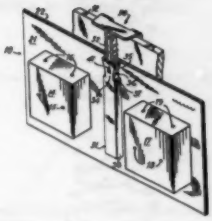
(C) an essentially continuous barrier layer of a composition consisting essentially of fluorine-containing organopolysiloxane situated between the interior of container (A) and the gel composition of (B), said barrier layer being coated on the interior wall of container (A).

4,455,692

CHEMICAL DISPENSER SAFETY HANGER

Robert A. Hegge, Ft. Mitchell, Ky., and David A. Jones, Kettering, Ohio, assignors to The Drackett Company, Cincinnati, Ohio

Filed May 9, 1983, Ser. No. 493,094
Int. Cl.³ E03D 9/02; A47B 96/06
U.S. Cl. 4—228 19 Claims



1. A hanger adapted to suspend a chemical dispenser from the rim of a tank, the hanger comprising an elongate sleeve integral with the dispenser, the sleeve having a restricted area proximate its top formed by opposed indented side wall segments that define a pair of shoulders with respect to the lower side walls of the sleeve, and a hanger member insertable within said sleeve, the hanger member comprising an elongate central portion having a plurality of side wall protrusions, a top portion extending rearwardly from the central portion and adapted to engage the rim of the tank, and a bottom portion forming opposed exterior shoulders with respect to the elongate central portion, the body of said bottom portion being substantially hollow such that the walls of the bottom portion are resilient below the shoulders, whereby the hanger member is inserted into said sleeve by engagement of said resilient bottom portion with said opposed indented side wall segments, which said bottom portion flexes due to its hollow nature and allows said opposed exterior shoulders to pass by said restricted area, said hanger member is adjustably positionable within the elongate sleeve by engagement of the protrusions between said indented wall segments, and whereby removal of the hanger member from the sleeve is substantially prevented by the hanger member shoulders abutting said sleeve shoulders.

4,455,693

SELF-CONTAINED, TWO-PIECE GASKET SEAL ASSEMBLY FOR DRAINS

Casper Caschera, 800 Durham Rd., Fremont, Calif. 94538

Continuation-in-part of Ser. No. 246,298, Mar. 23, 1981. This application Jun. 15, 1982, Ser. No. 388,648
Int. Cl.³ A47K 1/14
U.S. Cl. 4—286 3 Claims

1. A self-contained gasket sealing arrangement for drain and pipe connections, including a first gasket member comprising a generally cylindrical, sleeve-like member adapted to be secured about a pipe within a pipe connection, said gasket member including a deep annular groove extending in one end thereof parallel to the axis of the gasket; a second gasket member including a generally cylindrical, sleeve-like portion which is adapted to be received within said annular groove of said first gasket member, and compression ring means disposed at opposed ends of said gaskets in assembled configuration for compressing said gasket members together in the axial direction and causing said second gasket member to expand said first gasket member radially inwardly and outwardly to effect a sealing impingement on the pipe and the pipe connection, said

second gasket member including a flange extending radially inwardly and outwardly from one end of said generally cylin-

drical, sleeve-like portion, said flange being substantially equal in inner and outer diameters to said first gasket member.

4,455,694

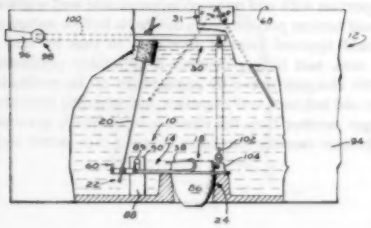
CLIP-ON ATTACHMENT FOR CONSERVING WATER DURING THE FLUSHING OF A TOILET

Thaddeus S. Dymon, 13 Fairway Dr., Ludlow, Mass. 01056

Filed Jul. 19, 1982, Ser. No. 399,742

Int. Cl.³ E03D 1/14

U.S. Cl. 4—325 **13 Claims**



7. A clip-on attachment for conserving water during the flushing of a toilet, said attachment comprising:

(a) a force-down member having clip means for securing the member onto the top of a pivotable flapper outlet valve inside a toilet flush tank said force-down member having a trunnion pin and a projection extending therefrom;

(b) a lever arm having a mid-portion which is rotatably connected to said trunnion pin on the force-down member and an end Portion which projects between said pin and said projection and is pivotable against said projection of the force-down member;

(c) a weighted float attached to an opposite end portion of the lever arm near the upper water line of the tank; and,

(d) latch means mountable on said tank to selectively effect a partial or total flush of the toilet by allowing or preventing movement of the float and the attached lever arm relative to the upper level of the water in the tank during the flushing of the toilet, whereby upon allowance of said movement said end portion will pivot about said trunnion and contact said projection to prematurely close said valve to effectuate a partial flush of the tank contents.

4,455,695

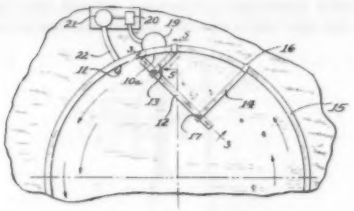
GUIDING UNIT FOR SWIMMING POOL CLEANERS

John L. Mikhel, 6429 W. 144th Ct., Crown Point, Ind. 46307

Filed Sep. 10, 1979, Ser. No. 74,165

Int. Cl.³ E04H 3/16

U.S. Cl. 4—490 **2 Claims**



1. The combination with a pool whose surface water flows along the pool wall toward an outlet; of a unit applicable to the pool and said wall, such unit formed with a floating guide bar directed at an angle to the wall, and a pair of tie bars connecting the end portions of the guide bar to the wall, the tie bars being of lengths corresponding to the angular spread of the guide bar where they connect with the same, said wall being curved and formed with a top rim, and the tie bars formed with hooks at the ends thereof and arranged at an angle to the longitudinal extent of the tie bars where they connect with said wall to engage said rim and thereby conform laterally with the curvature of the wall.

4,455,696

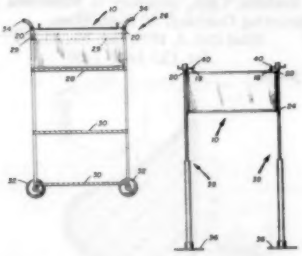
PORTABLE GRAVITY BATH

Albert A. Assanah, 3407 Wild Cherry Rd., Baltimore, Md. 21207; Fitzroy Assanah, and George G. Assanah, both of 3526 Overview Rd., Baltimore, Md. 21215

Filed Dec. 10, 1981, Ser. No. 329,447

Int. Cl.³ A47K 3/02

U.S. Cl. 4—584 **8 Claims**



1. A portable liquid container, comprising:

an enclosed structure, said enclosed structure being compact and portable by carrying manually, said enclosed structure being hollow, said enclosed structure being for the purpose of holding and containing a liquid for subsequent disposal, said hollow enclosed structure being fabricated from lightweight flexible water proof material, said flexible waterproof material having insulating qualities, said enclosed structure having a first side and a second side, a first end and a second end, a bottom, and a top, said first and second sides, first and second ends, bottom, and top each being flat and spaced apart and suitably affixed to each other to form said enclosed structure into a rectangular prism-like structural configuration, said hollow enclosed structure having first, second, and third apertures

therein, each of said apertures communicating the hollow inside of said enclosed structure with the exterior thereof, said first aperture being located at a first uppermost corner of said enclosed structure at a juncture of said top, said first side, and said first end, said second aperture being located at a second uppermost corner of said enclosed structure at a juncture of said top, said first side, and said second end, said third aperture being located at a lowermost corner of said enclosed structure at a juncture of said bottom, said first side and said second end, said lowermost corner being the corner directly below said second uppermost corner;

a first hollow tubular member, said first hollow tubular member having a first end and a second end, said first end of said first hollow tubular member being suitably affixed to said first aperture in said hollow enclosed structure, said first hollow tubular member thereby communicating said hollow inside of said hollow enclosed structure through said first aperture and through said first hollow tubular member with the exterior thereof, said first hollow tubular member having a removably affixed cap on the distal second end thereof;

a second hollow tubular member, said second hollow tubular member having a first end and a second end, said first end of said second hollow tubular member being suitably affixed to said second aperture in said hollow enclosed structure, said second hollow tubular member thereby communicating said hollow inside of said hollow enclosed structure through said second aperture and through said second hollow tubular member with the exterior thereof, said second hollow tubular member having a removably affixed cap on the distal second end thereof;

a drain valve means, said drain valve means having a first end and a second end, said first end of said drain valve means being suitably affixed to said third aperture in said hollow enclosed structure, said drain valve means thereby communicating said hollow inside of said hollow enclosed structure through said third aperture and through said drain valve means with the exterior thereof, said second end of said drain valve means being suitably configured for the attachment of a hose means; and

a plurality of hanger members, said plurality of hanger members being suitably affixed to the exterior of said hollow enclosed structure, said plurality of hanger members each being configured in a loop-like form, one of said plurality of hanger members being located on said top of said hollow enclosed structure at the juncture of said top with said second side at said first end, another of said plurality of hanger members being located on said top of said hollow enclosed structure at the juncture of said top with said second side at said second end, said plurality of hanger members being suitable as hand grips to manually carry said hollow enclosed structure and for hanging said hollow enclosed structure from mechanical supports, said hollow enclosed structure thereby being tilted toward side of said drain valve means when suspended from said plurality of hanger members, said first and second hollow tube members serving as fill ports and as vents when at least one of said removably affixed caps is removed from said hollow tubular members, said tilting of said hollow enclosed structure toward side of said drain valve means assuring complete drainage through said drain means when said drain valve means is used as a discharge means.

4,455,697

FOLDABLE CRIB OR PLAYPEN OF REDUCED ENCUMBRANCE

Ettore Rovida, Via Lupi di Toscana 10, Salo' (Brescia), Italy

Filed Sep. 29, 1982, Ser. No. 428,211
Int. Cl.³ A47D 7/00
U.S. Cl. 5—99 C **6 Claims**

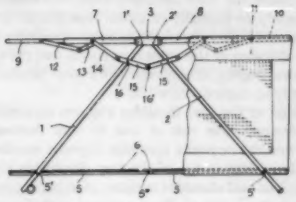
1. A foldable crib comprising:

two pairs of legs;

a stirrup pivotally connected to each pair of legs for displacement of each pair of legs from a spread position to a substantially parallel folded position;

two pairs of lower frame member, each member in each pair extending toward each other member in each pair and pivotally connected thereto for displacement of said two pairs of lower frame members from a spread position to a folded position;

a pair of supports supported on said pair of lower frame members, said pair of supports displaceable from a co-planar spread position to a folded position;



two pairs of rods pivotally connected to said stirrups and extending in opposite directions from said stirrups in a spread position thereof, said rods being displaceable into a folded position;

a pair of U-shaped elements each having ends telescopically engaged with one rod of each pair of rods; and

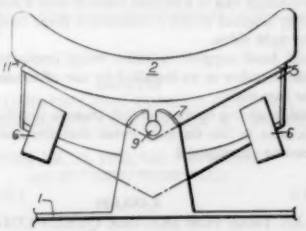
articulating means connected between said pair of U-shaped elements and said two pairs of rods for telescopically retracting said pair of U-shaped elements with respect to said pair of rods with said pair of rods in their folded position.

4,455,698

ADJUSTABLE UPPER BODY REST

George D. Eary, Sr., R4 #27 Pinecrest Dr., Chesapeake, Ohio 45619

Filed Oct. 21, 1981, Ser. No. 313,244
Int. Cl.³ A47G 9/00
U.S. Cl. 5—436 **5 Claims**



1. An adjustable upper body rest for the head and shoulder portion of the human body in a predetermined position and comprising:

a. a base member,

b. a pair of laterally spaced apart resilient shoulder support members supported on plastic support forms adapted to support the shoulders of a human body in a predetermined position,

c. each of said shoulder support members being so attached to allow limited lateral and longitudinal movement relative to the base and allow complete removability from the said base,

d. each of said shoulder support members being so attached

to allow limited rotational movement around a vertical axis,

e. each of said shoulder support members being configured in a convex manner widthwise at the tops or resting surfaces for a short distance at the ends nearest the head rest and configured in a concave manner widthwise for a longer distance at the opposite ends,

f. each of said shoulder support members being so attached to allow positioning at a lower or higher elevation in a stabilized manner by the use of slight pressure of the human hand,

g. covers for said shoulder support members made completely or partially of cloth, thin plastic or the like,

h. each of said shoulder support members being concave widthwise at the central portions and the outer edge portions sloping downward somewhat similar to a modified printed capital letter "M",

i. either of the two shoulder support members providing an adequate arm rest at one of two desireable elevations when the opposite shoulder support member is providing a head rest at one of the two desireable elevations,

j. each of said shoulder support members containing recesses or holes in the resilient material and plastic support form to allow sounds of a radio or radio speaker that may be fitted alternately to the underneath side of the plastic support form, to reach the ear of the user,

k. a head support member or resilient material supported on a plastic support form centrally located between the two shoulder support members but forward and toward the top of the base of the upper body rest,

l. said head support member configured to be concave laterally and longitudinally and resembling an elongated dish and configured so the resilient material and the plastic support form contains recesses in two places at the opposite edges nearer the top end to allow sounds of a radio or radio speaker that alternately may be fitted to the underneath side of the plastic form to reach the ear of the user, as well as to provide relief of pressure on the user's eye which would be present if there were not recesses in the resilient material,

m. said head rest being higher at the forward end and extended considerably beyond the base of the upper body rest to prevent contact of less resilient areas of the upper body rest with a headboard of a bed, the user's arms or such other worrisome encounters,

n. said head rest being rotatable that rotates about a near horizontal axis in a limited manner which is approximately thirty degrees below a horizontal plane to the left and to the right sides,

o. said head support member being removeable from the base member or re-installed by use of modest pressure at the two ends,

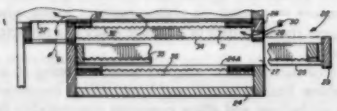
p. said head rest being rounded areas to preclude damage to the user in the unlikely event that the head rest should become disengaged.

4,455,699

POLLEN TRAP FOR DOUBLE QUEEN COLONY WITH QUEEN EXCLUDER

Royden Brown, 4343 E. Keim Dr., Paradise Valley, Ariz. 85253

Filed Sep. 29, 1982, Ser. No. 428,050
Int. Cl.³ A01K *47/06*
U.S. Cl. 6—4 R **6 Claims**



1. A pollen trap for collecting pollen from bees as they enter a beehive positioned between the two portions of a double queen colony comprising:

a frame having an open top and dimensioned to fit as one of the axially positioned parts of a vertically stacked beehive.

a drawer slidably arranged in said frame to assume a substantially horizontal position in the hive,

said drawer having a bottom surface comprising a first screen, the mesh size of which is smaller than the pollen dropped thereon by the bees,

a second screen mounted in said frame above said drawer and having a mesh size smaller than the size of the pollen carrying bees for prohibiting them from entering the drawer,

a pair of parallel and spacedly arranged third and fourth screens mounted on said frame, but offset above said second screen and forming an elongated space between said second screen and said pair of screens,

said third and fourth screens having mesh openings offset from each other causing bees crawling through said pair of screens to be forced to follow a circuitous path, divesting their legs of a substantial portion of the pollen carried thereon,

an entranceway for the pollen carrying bees into the pollen trap positioned adjacent the front and above said drawer and connected with one end of said space between said second screen and said pair of screens,

said frame defining a passageway behind said drawer for the pollen collecting bees which passageway interconnects the first portion and second portion of the double queen colony so the pollen collecting bees after passing said third and fourth screens can enter either portion, and

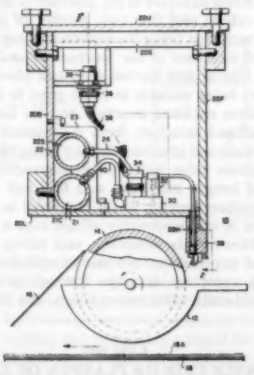
a grate having an opening therein small enough to preclude a queen from passing therethrough mounted in the pollen trap over said passageway.

4,455,700

METHOD FOR TREATING TEXTILE MATERIALS

Billy J. Otting, Lafayette, Ga., assignor to Otting International, Inc., Lafayette, Ga.

Division of Ser. No. 361,037, Mar. 23, 1982. This application Jul. 28, 1983, Ser. No. 518,195
Int. Cl.³ D06B *1/06*
U.S. Cl. 8—151 **9 Claims**



1. A method of treating a continuously moving textile web comprising:

(a) conveying the web past at least one treating station;

(b) establishing at the treating station a rotating liquid base film on a roller;

(c) spraying a plurality of streams of gaseous fluid onto the roller to rearrange the liquid film to form a pattern; and

(d) transferring the rotating film of liquid to the face of the web.

4,455,701

METHOD OF VARYING A MANUALLY ADJUSTABLE PROGRAM COURSE OF AN AUTOMATICALLY OPERATING WASHING MACHINE

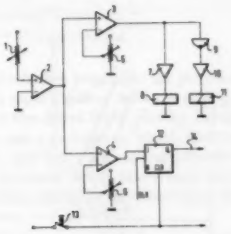
Thomas Stehr; Lieselotte Brodzina, and Richard Graf, all of Berlin, Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Aug. 6, 1981, Ser. No. 290,516

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030656

Int. Cl.³ D06F *33/02*

U.S. Cl. 8—158 1 Claim



1. Method of varying a manually adjustable program course of an automatically operating washing machine having at least one cold water inlet and at least one warm water inlet, the program course controlling laundry washing time, laundry washing temperature and laundry motion cycles between a beginning and an end of the program course in dependence on the temperature of water admitted to the machine through the inlets, which comprises providing an initial phase for the inflow of warm water into the machine, measuring the temperature of water admitted to the machine at the beginning of the program course after the initial inflow phase, and adjusting the time, temperature and motion cycles of the program course in dependence on the initial temperature determined by the measurement.

4,455,702

FOOTWEAR MANUFACTURE

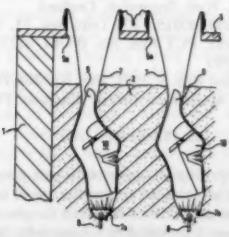
Richard E. F. Marris, Kendal, England, assignor to K. Shoemakers Limited, Kendal, England

Filed Jan. 18, 1982, Ser. No. 340,270

Claims priority, application United Kingdom, Jan. 16, 1981, 8101318

Int. Cl.³ A43D *9/00*

U.S. Cl. 12—142 R 5 Claims



1. A method for manufacturing outer footwear, such as a shoe, which includes the step of dry or moist heat setting a lasted shoe, said method comprising:

inserting the shoe from above into the open end of a sleeve of flexible impermeable material having a closed lower end and which is fixed in position at its open end so as to be suspended with the shoe therein; and

wholly or partially immersing said shoe and sleeve in a heated fluidized solid material contained in a bath.

4,455,703

DOCKBOARD ASSEMBLY

Klaus Fromme, Milwaukee, and James Hagen, Hartland, both of Wis., assignors to Delta Development Group Internat'l., Inc., Milwaukee, Wis.

Filed Mar. 8, 1982, Ser. No. 355,688

Int. Cl.³ E01D *1/00*

U.S. Cl. 14—71.3 10 Claims

1. An adjustable dockboard comprising a ramp member,

means for hingedly mounting said ramp member for pivotal movement on a loading dock, means mounted on the loading dock for biasing said ramp member to an elevated position,

a tread plate assembly mounted for telescopic movement within said ramp member between a first position within said ramp member to a second position having a portion of said tread plate assembly forming a continuous extension of the upper surface of said ramp member on engagement with the bed of a carrier,

travel stop means between said ramp member and said loading dock for locating said ramp member at a position flush with the top of the dock, means mounted on said tread plate assembly in a position to move said travel stop means to a position allowing for the ramp member to move below the top of the loading dock when the tread plate assembly is in the second position, and

means connected to said ramp member for selectively moving said tread plate assembly between the first and second positions.

4,455,704

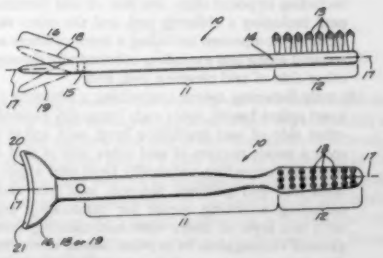
TOOTHBRUSH AND TONGUE CLEANER

Robert L. Williams, 829 W. Olive Ave., Apt. A, Monrovia, Calif. 91016

Filed Jul. 30, 1982, Ser. No. 403,402

Int. Cl.³ A47L *13/50, 13/12*

U.S. Cl. 15—111 4 Claims



1. A toothbrush and tongue cleaner combination comprising:

a linear tooth brush handle having a first brush handle terminus and

a second brush handle terminus, said handle adapted and sized for human hand manipulation,

a conventional tooth brush bristle segment having multiple cleaning brush bristles disposed in said first brush handle terminus, said bristle segment integrally secured to said first brush handle terminus,

an integral crescent shaped arcuate tongue scraper member centrally disposed and secured at the arcuate structure mid-curve to the opposed second brush handle terminus at an included angle of not more than 60° to said second handle terminus, the tongue scraper interior arc of the crescent shaped scraper having a dull scraping edge sized and adapted to clean the top surface of a human tongue, said dull scraping edge being coplanar along the entire length of the crescent shaped interior arc, said scraper member gradually tapering along its length from the end of the second brush handle terminus to said dull knife edge,

said brush bristle segment adapted to brushing teeth and said scraper member adapted only to scraping the user's tongue top surface.

4,455,705

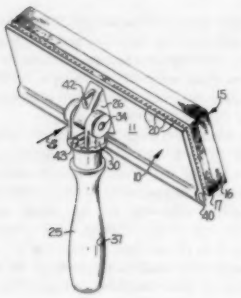
CLEANING DEVICE

John W. Graham, Simpsonville, S.C., assignor to Swiss-Tex Incorporated, Piedmont, S.C.

Filed Aug. 25, 1982, Ser. No. 411,463

Int. Cl.³ A47L *1/06*

U.S. Cl. 15—121 **9 Claims**



1. A cleaning device characterized by having an easily removable and replaceable cleaning component, said cleaning device comprising

(1) a molded plastic applicator head having opposed sides,

(2) handle means attached to one side of said applicator head for manipulating said applicator head in a cleaning motion over a surface to be cleaned,

(3) said cleaning component being of generally the same configuration as the other side of said applicator head and including opposed sides, one side of said cleaning component including a cleaning pad, and the other side of said cleaning component including a layer of fibers adhesively secured along and extending substantially throughout said other side of said cleaning pad, and

(4) male fastening means comprising a plurality of spaced-apart spikes having inner ends integrally molded with the other side of said applicator head, said spikes extending over a major portion of said other side of said applicator head and extending outwardly from said applicator head with free end portions thereon, said free end portions including attaching means for penetrating engagement with said layer of fibers when said cleaning component is pressed thereagainst to prevent lateral movement of said cleaning component relative to said applicator head during use of said cleaning device and permitting said cleaning component to be stripped from said applicator head for replacement.

4,455,706

PROCESS AND APPARATUS FOR THE REMOVAL OR CONTROLLED REDUCTION OF ADHERENT FILMS OF LIQUID ON HARD SURFACES

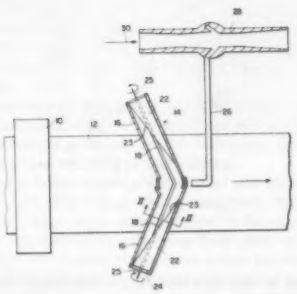
Jurgen Volkmann, Schwefe, and Hans H. Gross, Erkrath, both of Fed. Rep. of Germany, assignors to Ing. Jurgen Volkmann, GmbH, Schwefe, Fed. Rep. of Germany

Filed Oct. 5, 1979, Ser. No. 82,173

Claims priority, application Fed. Rep. of Germany, Oct. 5, 1978, 2843449

Int. Cl.³ A47L *5/38*

U.S. Cl. 15—306 A **14 Claims**



6. Apparatus for the removal or reduction in thickness of an adherent film of liquid from a sheet comprising:

an elongated suction nozzle having a longitudinal opening of which at least one longitudinal edge comprises a scraping tool, said suction nozzle being pointed transversely to the direction of movement of said sheet and which is movable relative to the surface of said sheet, both longitudinal edges of the suction nozzle comprising vacuum sealing strips which sealingly contact said surface, said suction nozzle viewed in top view of the surface to be treated being V-shaped and being oriented relative to the surface of said sheet in such a way that the apex of the V-shaped nozzle lags in relation to the ends of the arms of the V-shaped nozzle;

means for adjusting the vacuum within said suction nozzle, said means having an inlet with an adjustable cross sectional area; and

means for changing the effective suction length of the nozzle opening.

4,455,707

CASTOR WITH BRAKING MEANS

Stafford T. Screen, Stourbridge, England, assignor to British Castors Limited, West Bromwich, England

PCT No. PCT/GB81/00015, 371 Date Sep. 21, 1981, 102(e) Date Sep. 21, 1981, PCT Pub. No. WO81/02273, PCT Pub. Date Aug. 20, 1981

PCT Filed Feb. 6, 1981, Ser. No. 303,717

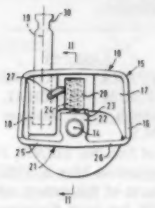
Claims priority, application United Kingdom, Feb. 12, 1980, 8004666

Int. Cl.³ B60B *33/00*

U.S. Cl. 16—35 R **5 Claims**

1. A castor comprising an upper body part provided with a brake element and attachment means for use in mounting the upper body part on an article of furniture for pivoting relative thereto about a pivot axis which is substantially upright in use of the castor, rolling means which is rotatable, in use, relative to the upper body part about a rolling axis transverse to and

offset from the pivot axis, a flexible lower body part to which the rolling means is mounted and with respect to which the rolling axis is fixed and a spring interposed between the upper body part and the lower body part, wherein the upper body part and the lower body part are integral with each other, the upper and lower body parts are united at two positions spaced equally in opposite directions from a plane which contains the



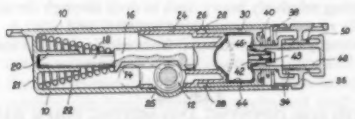
rolling axis and which is parallel to the pivot axis, and wherein the lower body part, together with the rolling means, is movable relative to the upper body part by flexing of the lower body part between a position in which said brake element on the upper body part bears against and prevents rotation of the rolling means mounted on the lower body part and a position in which the brake element is separated from the rolling means.

4,455,708

DOOR CLOSER HAVING A BRAKING MECHANISM COMPRISING AN ELASTOMERIC BAG

Gérard Saigne, Larche, France, assignor to Paumellerie Electrique, Larche, France

Filed Jun. 21, 1982, Ser. No. 390,364
Claims priority, application France, Jun. 23, 1981, 81 12274
Int. Cl.³ E05F *3/04*
U.S. Cl. 16—56 **10 Claims**



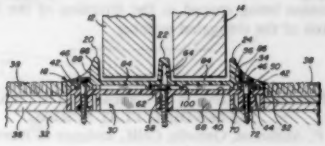
1. In a door closer comprising pivotally interconnected arms and a closing device mounted at one end of one of the arms and comprising a closed housing, a first piston mounted in the housing and movable between an open door position and a closed door position, a return spring for biasing the piston to the closed door position, means drivingly connecting said one arm to the piston so that the piston is displaced by the arm to said open door position when the door opens in opposition to the action of the return spring, and means for braking the displacement of the piston toward said closed door position under the action of the return spring; the improvement wherein said braking means comprises a sealed bag containing a viscous gum which is deformable but incompressible, a hollow second piston containing the bag and means for elastically biasing the second piston in a direction opposite to said return spring and toward an adustable position, wherein the bag is abutted by the first piston and the gum is deformed as the first piston approaches the door closed position.

4,455,709

FLOOR MOUNTED GUIDE AND SHIM ASSEMBLY FOR SLIDING DOORS

Walter D. Zanini, 1421 Myrtle, Turlock, Calif. 95380

Filed Jun. 16, 1982, Ser. No. 389,365
Int. Cl.³ E05D *13/02*
U.S. Cl. 16—90 **7 Claims**



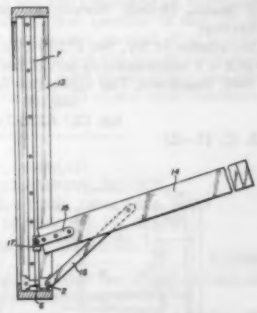
1. A guide and shim assembly for roller mounted or sliding doors comprising a one piece unitary guide provided with a set of upwardly extending walls to define a channel for guiding and passing a door therethrough, a shim of a predetermined and selected vertical thickness positioned under the guide, means aligning the guide and shim when stacked, the aligning means comprising projections on an upper surface of the shim and complementary receiving recesses in an undersurface of the guide and means securing the guide and shim to a supporting floor so that the channel can be positioned level with a surrounding carpeted area, the securing means comprising a central opening in the shim for a securing screw which is covered by the guide and aligned outer openings in both the shim and guide for further securing screws extending through the guide and shim.

4,455,710

ELONGATED WINDOW MOUNTING MEMBER HAVING A PIVOT POINT AND A SHORT SLIDE RAIL SECTION

Jan Johansen, Oslo, Norway, assignor to A/S Grorud Jernvarefabrik, Oslo, Norway

Filed Feb. 23, 1982, Ser. No. 351,565
Claims priority, application Norway, Mar. 13, 1981, 810871
Int. Cl.³ E05D *15/28*
U.S. Cl. 16—221 **6 Claims**



1. A mounting assembly for a sliding window sash supported in a window frame by two hinge arms which are connected at one end to the window sash and at the other end, respectively, to a fixed pivot point and to a slide shoe on a slide rail in the window frame, said assembly comprising a separate elongated member extending transversely to the direction of movement of the slide shoe on the slide rail and having a longitudinal axis and means for mounting said member in said window frame, said member including:

means for attaching one of said hinge arms to said window

frame so as to provide the fixed pivot point for said one hinge arm; and,

a separate section of said slide rail for slidably receiving said slide shoe on the other of said hinge arms, said slide rail section extending transversely to said elongated member at a fixed distance from the fixed pivot point for said one hinge arm and said separate section and the attaching means being spaced in the direction of the longitudinal axis of the elongated member.

4,455,711

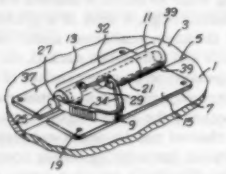
HINGE HAVING A LATERALLY OUTWARDLY EXTENDING FLAT SPRING

John P. Anderson, Ontario, Calif., assignor to Hartwell Corporation, Placentia, Calif.

Filed Jul. 20, 1981, Ser. No. 284,922

Int. Cl.³ E05D 7/10

U.S. Cl. 16—229 30 Claims



1. A quick release hinge/latch comprising

a housing having a first tube thereon;

a pin adapted to slide within said first tube; and

a flat spring having a first end fixed relative to said housing and a second end fixed to said pin, said flat spring biasing said pin axially outwardly of said first tube and extending laterally outwardly of said tube from each said end of said flat spring for manual gripping between said ends laterally outwardly of said tube to compress said flat spring and retract said pin into said first tube.

4,455,712

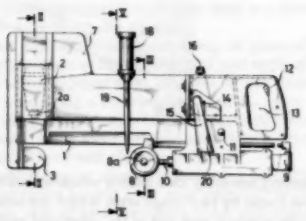
MEANS FOR SPLITTING CARCASSES

Leif Skaiaa, Drobak, Norway, assignor to Elkem a/s, Oslo, Norway

Continuation of Ser. No. 272,994, Jun. 12, 1981, abandoned, which is a continuation-in-part of Ser. No. 181,470, Aug. 26, 1980, abandoned. This application Apr. 25, 1983, Ser. No. 486,158

Int. Cl.³ A22B 5/20

U.S. Cl. 17—23 4 Claims



1. Apparatus for splitting a carcass comprising:

(a) a frame;

(b) a knife having two ends;

(c) said knife at one of the ends thereof being pivotally mounted on said frame;

(d) means adjacent the other end of said knife for vertically oscillating the other end of said knife for providing a short oscillating cutting stroke, said knife oscillating at a frequency greater than about 600 strokes per minute;

(e) first guide means adjacent said other end of said knife said first guide means including a guide member adapted for engagement of the dorsal side of the carcass adjacent the vertebral column of the carcass; and

(f) second guide means located intermediate the ends of the knife for guiding said knife along the vertebral column in the spinal core thereof.

4,455,713

METHOD AND APPARATUS FOR REMOVING TRASH FROM MATERIAL

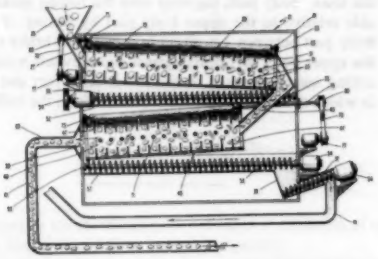
Joseph K. Jones, Raleigh, N.C., assignor to Cotton Incorporated, New York, N.Y.

Continuation-in-part of Ser. No. 118,977, Feb. 6, 1980, Pat. No. 4,338,705. This application May 5, 1982, Ser. No. 375,178

The portion of the term of this patent subsequent to Jul. 13, 1999, has been disclaimed.

Int. Cl.³ D01G 9/00

U.S. Cl. 19—80 R 18 Claims



1. A method of removing trash from material, comprising the steps of:

feeding the material to an inside of a drum having a screen on the periphery thereof;

rotating the drum;

cyclically lifting the material toward an upper portion of the drum with a plurality of finger-shaped baffles carried by the periphery and dropping the material directly onto the screen at a lower portion of the drum to break up clusters of material and separate the trash;

permitting relatively heavy trash to drop through the screen while retaining the remaining material; and

continuously clearing material from openings in the screen.

4,455,714

METHOD FOR OPENING AND MIXING FIBER BALES

Georg Goldammer; Günter Mahrt, and Joachim Dämmig, all of Ingolstadt, Fed. Rep. of Germany, assignors to Schubert & Salzer, Ingolstadt, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 193,162, Oct. 2, 1980, Pat. No. 4,382,316. This application Apr. 28, 1983, Ser. No. 489,486

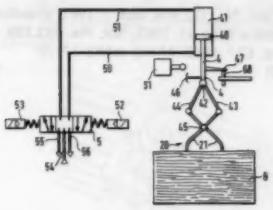
Claims priority, application Fed. Rep. of Germany, Oct. 10, 1979, 2939890

Int. Cl.³ D01G 7/06

U.S. Cl. 19—81 1 Claim

1. A method for opening and mixing fiber material from bales in accordance with predetermined proportions in the mixture wherein the fiber material is removed in a desired weight from each bale by being taken off in individual amounts and the amount removed is measured, comprising: removing an initial weight which lies below the desired weight which is first associated with each constituent of the mixture and when the initial weight or the desired weight of the constituent less the initial weight is reached, the amount of fiber material taken off from the said bale is reduced from said initial weight and removed in reduced amounts until the desired weight is

reached, whereupon the amount of fiber material taken off from a next bale is increased again to an initial weight associated with the next constituent at the beginning of the operation of removing the next constituent of fiber material of the mixture from said next bale.



4,455,715

CABLE CLAMP

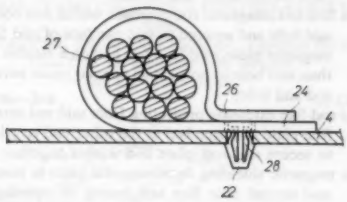
Kazuhiro Matsui, Toyoake, Japan, assignor to Kitagawa Industries Co., Ltd., Nagoya, Japan

Filed Aug. 23, 1982, Ser. No. 410,585

Claims priority, application Japan, Aug. 27, 1981, 56-126760[U]

Int. Cl.³ B65D 63/00

U.S. Cl. 24—16 PB **3 Claims**



1. A cable clamp comprising:

a resilient plastic band having a first end and a second end, said band being bendable in an arcuate shape such that said first and second ends may be positioned in facing parallel relation, said band including a preformed small diameter bend adjacent said first end and an elongated first end portion extending a first length from said small diameter bend to said first end;

a hole in said band adjacent said second end and an elongated second portion extending a second length from said hole to said second end, said second length being at least as great as said first length; and

a wedge shaped engaging projection fixed to said band between said small diameter bend and said first end at a position spaced from said small diameter bend by a distance substantialiy less than half said first length, said engaging projection extending perpendicular to said band such that it may be inserted through said hole when said first and second ends are in said facing parallel relation, whereby when said engaging projection is inserted through said hole to a clamping position, said first and second end portions are in substantial surface contact thereby preventing disengagement of said projection in said hole by a lever action of szid elongated first end portion against said second end portion.

4,455,716

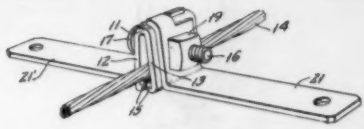
TAP BRACKET OR THE LIKE

Ignazio Leonardo, Mountainside, N.J., assignor to Diamond Communication Products, Inc., Garwood, N.J.

Filed Jun. 22, 1982, Ser. No. 390,913

Int. Cl.³ F16G 11/00

U.S. Cl. 24—115 A **6 Claims**



1. As an article of manufacture, a tap bracket or the like, comprising a cable clamp member for secure attachment to a selected location along a longitudinal stretch of messenger wire or the like of given diameter, and a single-piece bent stiff metal-strip bracket member loosely assembled by an engaged nut and bolt; said clamp member comprising two side panels of stiff metal strip integrally connected by a single upper-edge longitudinal bend and divergent downwardly at an acute angle to their lower longitudinal edges, at least one of said side panels having at its lower longitudinal edge a reversely and inwardly and upwardly bent flange of upward extent less than the upward extent of said one side panel and oriented at an acute angle to its associated side panel, the inner limiting edge of said flange being spaced from the nearest region of the other panel to an offset extent slightly less than said given diameter, whereby said clamp may be applied to the cable with snap action via the space at said offset, and said panels each having a bolt aperture at a bolt-shank alignment sufficiently offset from said flange to accommodate the cable between said flange and said bolt alignment, the upwardly bent edge of said flange being at sufficient offset beneath said bolt shank to accommodate said given diameter; said bracket member comprising an arm of stiff sheet metal having an integral upstanding flat leg at one end and a reversely bent hook formation at the end of said leg, the flat of said upstanding leg confronting the outer surface of one of said panels and the hook formation having curved and fitted conformance to the convex curvature outside the bend between said panels, and said upstanding leg having a bolt aperture in register with the bolt aperture of said one side panel, the shank of said bolt passing through all of said apertures, whereby upon setting the nut and bolt to clamp to the cable, the tap-bracket arm is fixed to the clamp and keyed against rotation by reason of the fit of said hook formation to said bend.

4,455,717

ROPE CLAMPING DEVICE

Robert C. Gray, P.O. Box 15262, Tulsa, Okla. 74112

Filed Sep. 22, 1982, Ser. No. 421,569

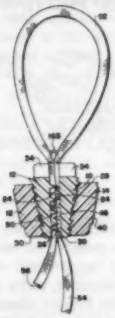
Int. Cl.³ F16G 11/00

U.S. Cl. 24—115 R **12 Claims**

1. A device for clamping together two lengths of rope, such as made of braided plastic, comprising:

a pair of inner core members, each having a mating inner surface so that when the members are positioned in engagement with each other they provide an elongated core having a generally tapered, truncated conical external surface having a larger external diameter end and a smaller diameter end, each of the core members having a recess in the inner surface in the plane of the longitudinal axis so that the mated core members provide a rope receiving opening therethrough when the members are matingly joined, the external frustrated conical surfaces of the members having threads formed thereon, the recesses in each core member having integral rope engaging projections extending therefrom; and

an outer ring member having a tapered opening therethrough, the taper of the opening matching the taper of the external surfaces of the said inner core members when abutted, the tapered opening having threads matching the



threads of the abutted core members, said recess in said core member providing means to receive lengths of rope therein and said outer ring screwed onto said core members to force said core members towards each other to clamp rope therebetween.

4,455,718

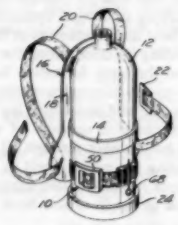
SCUBA TANK WEIGHT STRAP

David L. Finnern, Costa Mesa, Calif., assignor to Joseph J. Ryan, Costa Mesa, Calif., a part interest

Filed Feb. 12, 1982, Ser. No. 348,351

Int. Cl.³ A44B *11/00*; B63L *11/02*

U.S. Cl. 405—186 **14 Claims**



1. An air tank weight strap system for use in scuba diving applications, comprising:

a scuba air tank adapted to hold a quantity of breathable air;

at least one conventional diving weight having an aperture extending therethrough;

an elongate flexible strap sized to be positioned and extend about the circumference of said scuba air tank and be inserted through the aperture formed in said at least one weight to carry said at least one weight thereon, said elongate strap comprising a pair of end strap portions and an intermediate strap portion, said intermediate strap portion formed of a resilient material adapted to provide continuous tension in said strap to tightly maintain said strap about the circumference of said air tank;

a pair of fastening members comprising a mating hinge, each of said fastening members being mounted to said strap adjacent opposite ends of said strap and adapted to be interconnected to retain said strap about the circumference of said scuba air tank; and

means for selectively interconnecting said pair of fastening members to permit said elongate strap to be rapidly released from said scuba tank.

4,455,719

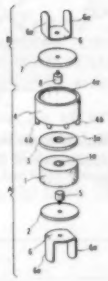
STOPPER USING A MAGNET

Tamao Morita, 41-1, 6-chome, Arakawa, Arakawa-ku, Tokyo, Japan

Continuation of Ser. No. 222,984, Jan. 7, 1981, abandoned. This application May 11, 1983, Ser. No. 492,159

Int. Cl.³ A44B *17/00*; A44C *13/10*

U.S. Cl. 24—303 **8 Claims**



1. A magnetic fastener comprising:

(a) a first fastening element, including

a permanent magnet having oppositely facing pole faces of opposite polarity and at least one peripheral edge, said magnet having a hole extending between the first pole face and the second pole face;

a first ferromagnetic plate in contact on one face thereof with said first pole face;

a first fastening washer secured to said first ferromagnetic plate on the other face thereof;

a first ferromagnetic rod disposed within and coaxial with said hole and secured to said one face of said first ferromagnetic plate, said first rod having a smaller diameter than said hole to provide an annular space between said rod and hole;

a rod-like extension projecting from said rod through said first plate and attached at the other end to said washer to secure said rod, plate and washer together;

a magnetic shielding ferromagnetic plate in contact with said second pole face and having an opening passing therethrough, which opening is coaxial with said hole; and

a nonmagnetic housing having an edge portion surrounding the at least one peripheral edge of said permanent magnet, inwardly directed extensions on said edge portion for securing said first ferromagnetic plate and said magnetic shielding ferromagnetic plate to said permanent magnet, the edge portion of said housing adjacent said magnetic shielding ferromagnetic plate defining an aperture coaxial with said hole; and

(b) a second fastening element detachably engageable with said first fastening element, including

a second ferromagnetic plate;

a second fastening washer secured to said second ferromagnetic plate; and

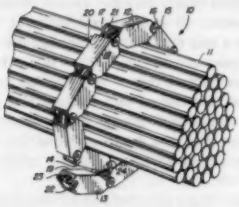
a second ferromagnetic rod having a diameter substantially equal to the diameter of said first rod secured to said second ferromagnetic plate, a rod-like extension projecting from said second rod through said second plate and attached at the other end to said second washer to secure said second rod, plate and washer together, so that when the first and second fastening elements are engaged, said second ferromagnetic rod projects into said hole and contacts said first ferromagnetic rod and said second ferromagnetic plate contacts said magnetic shielding ferromagnetic plate.

4,455,720

CLAMP APPARATUS

Bailous C. Sutton, 1182 Fernlea Dr., West Palm Beach, Fla. 33409

Filed Jun. 14, 1982, Ser. No. 387,928
Int. Cl.³ A44B 21/00; B65D 63/00
U.S. Cl. 24—20 S 12 Claims



1. A clamping mechanism for clamping cables, cords, or the like, comprising in combination:

a plurality of hollow clamp segments, each segment being movably pinned to at least one other segment forming pivot points and having a pair of end segments not attached to each other; and

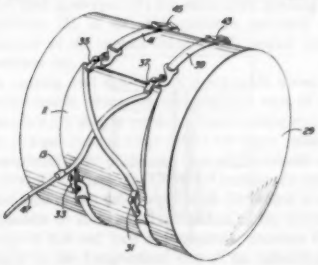
a flexible biasing means extending through each said clamp segment hollow portion of each of said plurality of clamp segments and said biasing means having at least each end thereof attached to each said end segment to apply a constant compression force to the pivot points of each clamp segment, whereby said clamping mechanism can be wrapped at least 180 degrees around one or more items extending therethrough for clamping said items together.

4,455,721

EXTERNAL CLAMPING DEVICE FOR INFLATABLE AIR BAG

Howard Leibovitz, 505 N. Lake Shore Dr., Chicago, Ill. 60611

Filed Sep. 13, 1982, Ser. No. 424,312
Int. Cl.³ B65B 63/00
U.S. Cl. 24—346 13 Claims



1. A device for externally clamping an inflatable air bag comprising:

first engaging means located on a first bracket member adjacent a first end thereof to grip one side of the air bag without damaging the material thereof;

second engaging means located on a second bracket member adjacent a first end thereof to grip the other side of the air bag without damaging the material thereof;

releasable tightening means to cause said first and second engaging means to forcibly clamp said air bag therebetween;

a stepped shoulder formed on the second end of each of said first and second bracket members, said stepped shoulders abutting one another to prevent pivoting of said bracket members as said tightening means is actuated to increase the clamping force on the air bag; and

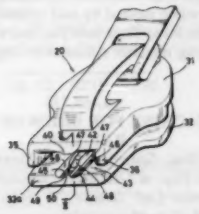
connecting means to permit the clamping device to be attached to an appropriate positioning arrangement.

4,455,722

SLIDER FOR SLIDE FASTENER

Kiyoshi Oda, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 2, 1982, Ser. No. 394,520
Claims priority, application Japan, Jul. 7, 1981, 56-105067
Int. Cl.³ A44B 19/26
U.S. Cl. 24—427 10 Claims



1. A slider for a slide fastener having a pair of rows of continuous fastener elements mounted on a pair of tapes along their respective inner longitudinal edges, comprising:

(a) a slider body including a pair of parallel spaced upper and lower wings joined at their front end by a neck, there being defined a Y-shaped guide channel between said wings for the passage of the fastener element rows of the slide fastener;

(b) a ridge projecting centrally from an interior surface of said lower wing and extending longitudinally of said guide channel from near said neck toward a rear end of said lower wing, said ridge being locatable between the inner longitudinal edges of the tapes to slidably engage coupling heads of the fastener elements, said ridge terminating short of said rear end of said lower wing; and

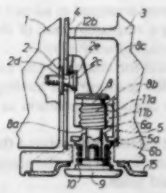
(c) said lower wing having in said interior surface a pair of furrows disposed one on each side of said ridge and extending parallel thereto from near said neck to said rear end of said lower wing for allowing the respective inner edge portions of the tapes to be displaced into said furrows respectively.

4,455,723

REMOVABLE COUPLING DEVICE BETWEEN A PHOTOGRAPHIC CAMERA AND AN ACCESSORY

Junji Umetsu, Tokyo, Japan, assignor to Ashai Optical Co., Ltd., Tokyo, Japan

Filed Jun. 23, 1981, Ser. No. 276,470
Claims priority, application Japan, Sep. 11, 1980, 55-129667[U]
Int. Cl.³ F16B 21/09; A44B 21/00
U.S. Cl. 24—647 2 Claims



1. In a removable coupling device between a photographic camera and an accessory of the type comprising at least two coupling pins secured to either one of said camera and said accessory and a coupling plate provided with key hole shaped openings to receive said coupling pins and secured to the other

of said camera and said accessory, the improvement comprising a sleeve bearing secured to either one of said camera and said accessory, an operating shaft fitted in said sleeve bearing, a restoring spring for said operating shaft, an intermediate member threaded on said operating shaft and provided with a rotation preventing member, a locking member pivotally supported by said intermediate member and provided with a member urged against one of said pins received in one of said key hole shaped openings when said operating shaft is rotated and an arm which when pushed by said operating shaft rotates said locking member away from said pin, and a spring for normally urge said locking member aginst said coupling plate.

4,455,724

CASTING MACHINE FOR GRIDS OF LEAD STORAGE BATTERIES

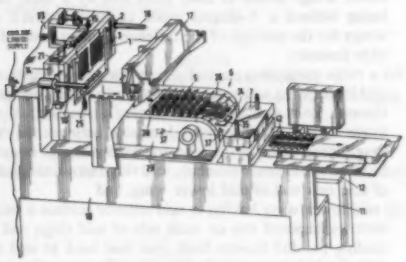
Friedrich Sperling, Gutenberg, and Aloys Hennecke, Brilon, both of Fed. Rep. of Germany, assignors to Accumulatorenwerk Hoppecke Carl Zoellner & Sohn GmbH & Co. KG, Cologne, Fed. Rep. of Germany

Filed Apr. 20, 1981, Ser. No. 255,617

Claims priority, application Fed. Rep. of Germany, Apr. 24, 1980, 3015726

Int. Cl.³ B26D *19/10*; B65G *29/00, 37/00*

U.S. Cl. 29—2 **21 Claims**



1. In a machine for the casting and subsequent stamping of grids for lead storage batteries, particularly of low-Sb and Pb-Ca alloys, having a pouring nozzle to receive and pour a predetermined quantity of melt into a vertically arranged casting mold below it, the improvement comprising

a transport means,

means operatively arranged on the casting mold comprising a lifter means for engaging a respective casting produced in the casting mold and for delivering the casting onto said transport means while keeping the casting in a vertical position, respectively,

said transport means being formed as a channel constituting a cooling path for hardening the castings,

means for passing a cooling fluid into said channel,

said transport means for transporting the castings in the vertical position thereof,

a deflection means arranged at an end of the cooling path for repositioning a respective one of the castings into a horizontal position, respectively,

a stamping means for stamping the casting, respectively,

a feed means for feeding said casting from the deflection means in the horizontal position to said stamping means, respectively,

a conveyor belt means for receiving the stamped said casting from said stamping means, the stamped casting constituting one of said grids,

said casting mold constitutes means for producing the respective casting with lugs on the upper lateral sides thereof,

said transport means comprises two driven endless chains arranged beneath said casting mold at a distance spaced apart from each other equal to approximately the distance between said lugs of the casting,

receiver means are fastened on said chains for gripping the lugs of the casting holding the latter in the vertical position,

coaxially arranged sprocket wheels engaging said chains located at an end of said cooling path,

said deflection means includes axially controlled moveable pins mounted on each of said sprocket wheels approximately at a mid-radius and projecting inwardly therefrom forming pairs of said pins, each of said pairs of pins engaging said respective one of said castings at a lower end of said respective one of said castings and guiding said respective one of said castings in a deflection movement of said chains into the horizontal position as a four-point support together with said receiver means on said chains, respectively, and

means for moving a selected pair of said pins for said engaging of said respective one of said castings, respectively.

4,455,725

METHOD AND APPARATUS FOR MAKING TUBULAR CONTAINERS, AT LEAST SUBSTANTIALLY CLOSED AT ONE END, FROM PIPE MATERIAL BY COLD-WORKING

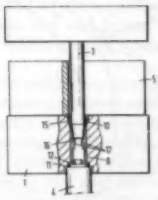
Petrus H. van Baal, Amersfoort, Netherlands, assignor to Amcur N.V., Netherlands

Filed Dec. 8, 1981, Ser. No. 328,653

Claims priority, application Netherlands, Dec. 22, 1980, 8006992

Int. Cl.³ B21D *51/54*

U.S. Cl. 29—1.3 **10 Claims**



1. Apparatus for making tubular containers having a substantially closed end from pipe blanks by cold working, said apparatus comprising:

(a) a single die having a substantially cylindrical through hole for receiving successive pipe lengths,

(b) a punch movable entirely through said hole from one end thereof, said punch displacing material from the inner walls of the pipe blank and having a shape corresponding to the interior configuration of the containers to be formed, and

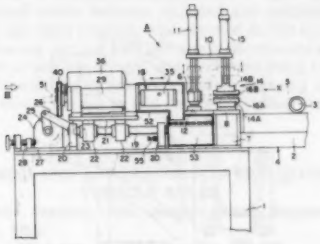
(c) a counter-punch for temporarily closing the opposite end of said hole with material displaced from the inner wall of the pipe, said die through hole having a first end where the punch enters it which defines the shape of a funnel, the smallest transverse dimension of which defines the outer diameter of the containers to be made.

4,455,726

CHAMFERING APPARATUS FOR END FACES OF TUBULAR MEMBERS

Teruaki Kawamura; Yukihiko Komatsu, and Hiroshi Yamane, all of Shimonoseki, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Sep. 14, 1981, Ser. No. 302,118
Claims priority, application Japan, Oct. 31, 1980, 55-154510
Int. Cl.³ B23P *23/04*
U.S. Cl. 29—33 T 8 Claims



1. Apparatus for simultaneously taper cutting the outer peripheral edge of the end face of a tubular member, taper cutting the inner peripheral edge of the same end face, and cutting the end face in a direction perpendicular to the axis of the tubular member, said apparatus comprising:

(a) an abutment member (6);

(b) first means comprising a telescopic hydraulic cylinder (11) for advancing said abutment member (6) into and retracting it away from a line of extension of the longitudinal axis of the tubular member (5) so as to prevent further axial movement of the tubular member (5) when said abutment member (6) is advanced;

(c) a conveyor (4) for transporting the tubular member (5) toward the abutment member (6) and thrusting the tubular member (5) against the abutment member (6);

(d) a chuck (14) provided between said abutment member (6) and said conveyor (4) for releasably holding the tubular member (5) in an axial position precisely defined by contact of the tubular member (5) against said abutment member (6);

(e) a cutting tool (18) which is rotatable about and axially reciprocable along the longitudinal axis of the tubular member (5), the tip portion of said cutting tool (18) having an oblique cutting edge (46A) for taper cutting the inner peripheral edge of the end face of the tubular member (5), a straight cutting edge (46B) for cutting the segment of the end face of the tubular member (5) which is immediately adjacent to and radially outward of the inner peripheral edge of the end face of the tubular member (5) at a right angle to the longitudinal axis of the tubular member (5), and an oblique cutting edge (47A) for taper cutting the outer peripheral edge of the end face of the tubular member (5) radially outwardly of and immediately adjacent to the segment of the end face of the tubular member (5) cut by said straight cutting edge (46B);

(f) second means (36, 38, 39) for rotating said cutting tool (18) around the longitudinal axis of the tubular member (5);

(g) third means (24, 25, 26) for axially reciprocating said cutting tool (18) along the longitudinal axis of the tubular member (5) towards and away from said axial position precisely defined by contact of the tubular member (5) against said abutment member (6);

(h) a linear guide (9) the axis of which is parallel to the axis of said telescopic hydraulic cylinder (11); and

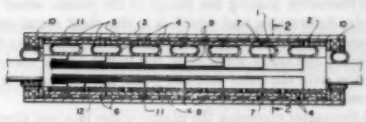
(i) fourth means (13, 13A) operatively connecting said telescopic hydraulic cylinder (11) to said linear guide (9) for slidably guiding the extension of said telescopic hydraulic cylinder (11).

4,455,727

FRICTION-DRIVEN ROLL FOR TREATING WEB-LIKE INTERMEDIATE PRODUCTS BY COMPRESSION

Wolfgang Tschirner, Tönisvorst, Fed. Rep. of Germany, assignor to Kleinewefers, Jaeggli Textilmaschinen AG, Switzerland, Fed. Rep. of Germany

Filed Jan. 29, 1982, Ser. No. 344,044
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1981, 3105171
Int. Cl.³ B21B *31/00*
U.S. Cl. 29—113 R 11 Claims



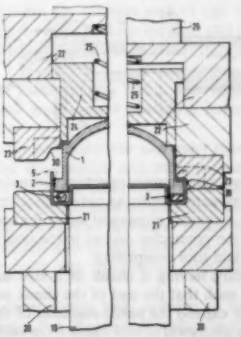
1. A friction-driven roll, comprising a stationary roll core, a supporting tube disposed over said roll core, a jacket rotatably mounted on said supporting tube, a plurality of elastic distension bodies disposed between said roll core and said supporting tube, antifriction bearing means disposed between said supporting tube and said jacket tube, said supporting tube comprising a plurality of link sleeves arranged end to end with a joint area between each adjacent pair of link sleeves, a plurality of coupling sleeves at least embracing each adjacent pair of link sleeves and the joint area between each adjacent pair of link sleeves, and wherein said distension bodies comprise hollow fluid pressure cushions, and a fluid pressure supply connected to said pressure cushions.

4,455,728

METHOD FOR CLAMPING TOGETHER HEAT EXCHANGER PARTS

Wolfgang Hesse, Remseck, Fed. Rep. of Germany, assignor to Suddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG, Stuttgart, Fed. Rep. of Germany

Division of Ser. No. 98,838, Nov. 30, 1979, Pat. No. 4,378,174. This application Sep. 30, 1982, Ser. No. 430,250
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1978, 2852415
Int. Cl.³ B21D *53/00*; B21K *29/00*; B23P *15/26*
U.S. Cl. 29—157.3 R 1 Claim



1. A method for clamping together heat exchanger parts, namely, a plastic water box having a flange thereon and a sheet metal end plate which accepts a bundle of tubes for the heat exchanger, the flange having an upper surface facing away

from the sheet metal end plate, a lower surface facing toward the sheet metal end plate, an outer surface extending between said upper and lower surfaces and facing toward the exterior of the plastic water box, and an inner surface opposite to the outer surface and facing toward the interior of the plastic water box, the lower surface of the flange having a certain area, the sheet metal end plate having a groove therein for receiving said flange, the groove having a bottom, the groove being defined by a continuous, straight deformable outer edge, an inner side disposed inwardly of the outer edge in opposed relationship thereto, and an underside which extends perpendicularly between the inner side and outer edge, the underside defining the bottom of the groove, the method comprising the steps of:

(a) placing a deformable seal on the bottom of the groove of the sheet metal end plate;

(b) thereafter placing the flange of the plastic water box on the deformable seal which is in the sheet metal end plate and thereby guiding the flange into the groove so that the inner and outer surfaces of the flange are in mating relation with the inner side and outer edge of the sheet metal end plate, respectively;

(c) thereafter clamping the plastic water box and sheet metal end plate together while deforming the seal until the seal approximately fills a space defined by the lower surface of the flange and the inner side, the outer edge and the bottom of the groove of the sheet metal end plate, whereupon the outer edge will then have a vertically upright standing area extending beyond the upper surface of the flange; and

(d) deforming certain parts of the vertically upright standing area of the sheet metal end plate by vertically moving a deforming tool into engagement with the certain parts of said area to roll the certain parts over the upper surface of the flange into generally horizontal positions while leaving other parts of such area generally in their vertically upright condition to thereby form the outer edge into an approximately corrugated form to hold the plastic water box and sheet metal end plate together in a clamped condition.

4,455,729

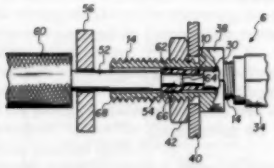
FIBER OPTIC CONNECTOR TOOL

John M. Dugan, Garland, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation of Ser. No. 238,180, Feb. 25, 1981, abandoned. This application Apr. 11, 1983, Ser. No. 484,017

Int. Cl.³ B23P *19/02*

U.S. Cl. 29—235 **7 Claims**



1. A fiber optics interconnection kit including a fiber optic connector mounted within an outer concentric tubular connection sleeve, a tubular alignment insert for use mounted around the end of the connector and an extraction tool for removing the insert, said tool comprising:

a tool body having a shank of a size insertable into said sleeve such that the end of the shank enters said insert to slightly expand the inside diameter of the latter, such that upon withdrawal of said shank from said sleeve, said insert remains on said shank end and is removed from said connector end, whereby to effect extraction of said insert without disassembling said connector and sleeve; and

a slider collar around said shank and having an inside diameter smaller than the outside diameter of said insert on said shank end, said collar being movable along said shank to force said insert off said shank end.

4,455,730

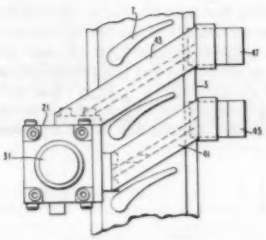
TURBINE BLADE EXTRACTOR

Paul Guenther, Aston, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 30, 1982, Ser. No. 413,208

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—252 **5 Claims**



1. Apparatus for removing blades affixed in a generally axially oriented groove by a pin from a rotor of an axial flow machine having multiple rows of blades, said apparatus comprising:

a base portion which fits between adjacent rows of blades;

a plunger slidably disposed in said base portion so as to be axially aligned with said groove;

means for applying a force to said plunger sufficient to shear one of said pins and move one of said blades in one of said grooves;

said means for applying a force comprising a hydraulic cylinder, a rocker arm pivotally mounted in the base portion, one end thereof contacting the plunger and the other end receiving the force from the hydraulic cylinder, and a spring interposed between the hydraulic cylinder and the rocker arm; and

means for clamping said base adjacent one of said blades and for resisting the reactive forces on said base when force is applied to said plunger.

4,455,731

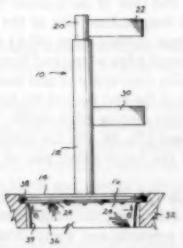
FILTRATION BAG REMOVER

Howard W. Morgan, P.O. Box 735, Michigan City, Ind. 46360

Filed Feb. 24, 1982, Ser. No. 351,776

Int. Cl.³ B23K *37/04*

U.S. Cl. 29—280 **3 Claims**



1. A device for removing a filter bag from a filter housing, said housing having an opening for receiving said bag, said bag supported within said housing opening and including a shape-retaining margin defining the opening into the bag, said device

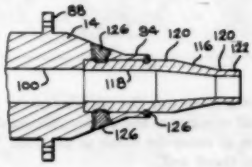
comprising a tubular member having a plate connected at one side face to one end of the tubular member, a shaft part extending through said tubular member and plate, an actuator disc having one side face located next to the opposite side face of said plate, said shaft part connected to said disc wherein rotation of the shaft part within said tubular member causes rotation of the disc relative to said plate, an arm pivotally connected at one end to the opposite side face of said disc adjacent the rotational center of the disc, means pivotally anchoring said arm at a location spaced from its pivotally connected one end to said disc and plate for radial movement relative to said disc rotational center between retracted and extended positions upon said shaft rotation, whereby said device is inserted into said housing opening with said arm in its retracted position and its plate at said bag margin, said shaft there being rotatable to shift said arm into its extended position engaging said bag margin to secure the bag to said device for pulling removal.

4,455,732

METHOD AND APPARATUS FOR REBUILDING VEHICLE AXLES

Leo C. Shiets, Fremont, Ohio, assignor to Axle Surgeons, Inc., Fremont, Ohio

Filed Jan. 15, 1982, Ser. No. 339,622
Int. Cl.³ B22D *19/10*; B60B *35/00*
U.S. Cl. 29—402.06 **6 Claims**



1. A method for rebuilding vehicle axles comprising the steps of:

removing an end adjacent portion of an axle;

providing a boring machine capable of being secured to the remaining portion of such axle;

securing such boring machine to such axle;

boring a cylindrical cavity in the end of such axle;

removing such boring machine from such axle;

providing at least a pair of generally opposed radially oriented passages extending from said cavity to the ouside wall of such remaining axle portion;

providing a stub axle;

installing such stub axle in such cavity of such remaining portion; and

securing such stub axle to such remaining axle portion by the deposition of material within such generally radially oriented passages.

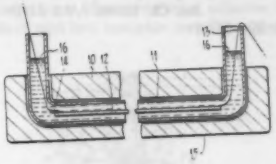
4,455,733

FURNACE COOLING ELEMENTS AND METHOD OF FORMING FURNACE COOLING ELEMENTS

Barry W. Smith, Keiraville, and Anthony J. Hudson, Dapto, both of Australia, assignors to The Broken Hill Proprietary Company Limited, Melbourne, Australia

PCT No. PCT/AU81/00052, 371 Date Dec. 29, 1981, 102(e) Date Dec. 29, 1981, PCT Pub. No. WO81/03221, PCT Pub. Date Nov. 12, 1981
PCT Filed May 8, 1981, Ser. No. 339,438
Claims priority, application Australia, May 8, 1980, PE3460
Int. Cl.³ B23P *17/00*; B21D *22/10*; C21B *7/10*
U.S. Cl. 29—421 R **12 Claims**

1. A method of forming a furnace cooling element, including the steps of positioning an external shroud member around an elongate metal cooling tube over a substantial length thereof; sharply increasing the pressure of a fluid within said inner metal cooling tube to expand said tube closer to said shroud member; casting a metal body around the combination of the inner metal cooling tube and its surrounding shroud member; and thereafter again sharply increasing the pressure of a fluid



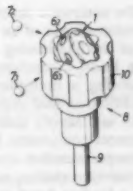
within said inner metal cooling tube to expand said inner metal cooling tube closer to said surrounding shroud member; and all without any welding occurring between said inner metal cooling tube and said shroud member.

4,455,734

METHOD OF ASSEMBLING UNIFORM-SPEED JOINT

Teruo Yoshioka, Kawagoe; Shiro Naito; Yuzo Abe, both of Hidaka, and Kuninobu Uchida, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1982, Ser. No. 443,111
Claims priority, application Japan, Nov. 19, 1981, 56-185666
Int. Cl.³ B23P *11/00*
U.S. Cl. 29—434 **1 Claim**



1. A method for assembling a uniform-speed joint having an inner rotary body and an outer rotary body which transmits a rotational force from one to the other through a plurality of small spheres in receiving holes on the disposed outer peripheral surface of said inner rotary body and including a first pair of small spheres diametrically facing each other where the intersecting angle between the rotation axes of said inner rotary body and said outer rotary body is variable and the rotational speed is not changed, said method comprising the steps of:

(a) fitting said first small spheres into a diametrically opposed pair of said small-sphere receiving holes in said inner rotary body;

(b) fitting said inner rotary body into said outer rotary body while maintaining the rotation axis of said inner rotary body perpendicular to the rotational axis of said outer rotary body with no interference between said first pair of small spheres and the edge of said outer rotary body;

(c) bringing the rotation axes of said inner rotary body and said outer rotary body into coincidence with each other; and

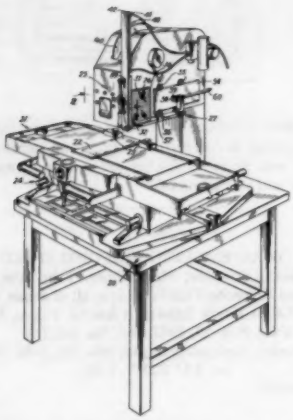
(d) swinging said inner rotary body relative to said outer rotary body about the diametrical swing axis passing through said first pair of small spheres; and (e) then fitting additional small spheres into the corresponding small-sphere receiving holes of said inner rotary body in the portion of said inner rotary body which is out of said outer rotary body as a result of the swinging step.

4,455,735

HIGH SPEED APPARATUS FOR INSERTING ELECTRONIC COMPONENTS INTO PRINTED CIRCUIT BOARDS

DeHart G. Scrantom, Shallotte, N.C., assignor to AVX Corporation, Great Neck, N.Y.

Filed Apr. 15, 1982, Ser. No. 368,670
Int. Cl.³ H05K *3/30, 13/04*
U.S. Cl. 29—564.1 **12 Claims**



1. Apparatus for the automatic insertion into a P.C. board positioned at an insertion station of an electronic component, such as a capacitor, or the like having a central body portion and axially extending leads, comprising a component supply station, means for storing a multiplicity of components in parallel stacked condition at said supply station, a forming station downstream of said supply station, first means for cyclicly feeding an endmost component from said stack to said forming station, a plunger member cyclicly shiftable toward and away from said insertion station, said plunger including a forming portion and a feeding head positioned to move in a path adjacent said forming station and feed station respectively on movements of said plunger toward and away from said insertion station, means on said forming portion for deflecting the leads of a component at said forming station into a substantially parallel depending condition responsive to movement of said plunger toward said insertion station, second feed means for advancing a formed said component from said forming to said feed stations in advance of return movement of said plunger from said insertion station to said feed station, and bifurcate means on said feeding head having gripper portions for receiving a formed said component at said feed station by engagement with said parallel leads responsive to movement of said plunger away from said insertion station.

4,455,736

STAPLE REMOVING APPARATUS

Trevor W. Owen, Mississauga, Canada, assignor to Owen Tricut Limited, Mississauga, Canada

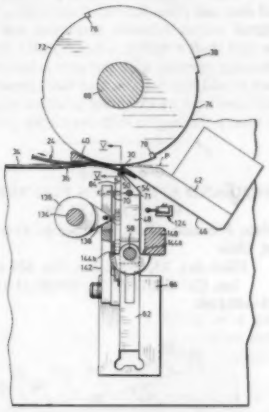
Filed Apr. 13, 1982, Ser. No. 367,863
Int. Cl.³ B26D *3/00*
U.S. Cl. 29—564.3 **9 Claims**

1. Apparatus for removing staples from sheet-form material, comprising:

means defining an opening into which a sheet can be inserted generally in a flat plan- with a staple to be removed from the sheet extending generally transverse to the direction of insertion;

an anvil having a leading edge disposed generally in said plane and extending generally normal to said direction of insertion, said anvil being adapted to deflect out of said plane the leading end portion of a sheet inserted into the opening;

stop means adapted to locate the staple in said sheet at a cutting station with portions of said staple at a first side of the sheet against said anvil leading edge, said stop means having a staple locating edge extending parallel to said anvil leading edge and positioned for contact by portions of said staple at the second side of said sheet;



means adapted to engage the portions of the staple located against said stop means and displace the staple towards the sheet so as to cause the staple to protrude from said first side of the sheet; and,

cutter means operable to slice through said protruding portions of the staple along a cut line generally parallel to said plane and in a direction towards said anvil whereby the staple is cut into portions which can separate from the sheet.

4,455,737

PROCESS FOR AND STRUCTURE OF HIGH DENSITY VLSI CIRCUITS, HAVING SELF-ALIGNED GATES AND CONTACTS FOR FET DEVICES AND CONDUCTING LINES

Gordon C. Godejahn, Jr., Santa Ana, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Division of Ser. No. 909,886, May 26, 1978, Pat. No. 4,277,881.
This application Mar. 11, 1981, Ser. No. 242,442
The portion of the term of this patent subsequent to Sep. 9, 1997, has been disclaimed.
Int. Cl.³ H01L *21/225, 29/78*
U.S. Cl. 29—571 **12 Claims**

1. A process for fabricating a field effect semiconductor device on a mononcyrstalline silicon substrate having a first surface on which said device is to be formed, comprising the steps of:

thermally oxidizing the surface of said semiconductor substrate to form a first silicon dioxide layer thereon,

forming a first silicon nitride layer on said first silicon dioxide layer,

retaining portions of said first silicon nitride layer and the corresponding underlying first silicon dioxide layer overlying a selected area of said substrate surface and removing remaining portions of said first silicon nitride and silicon dioxide layers to expose said substrate surface outside said selected area,

thermally growing a field oxide on said exposed surface of said substrate surrounding said selected area,

removing said first silicon nitride and silicon dioxide layers,

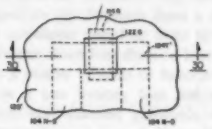
thermally growing a second silicon dioxide layer on said selected area,

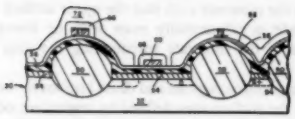
forming a second silicon nitride layer on said second silicon dioxide layer on said field oxide,

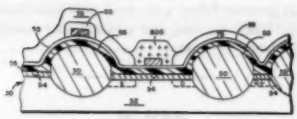
forming a thin silicon oxynitride layer on said second silicon nitride layer,

depositing a layer of doped polysilicon on said silicon oxynitride layer,

delineating said polysilicon layer to define a gate polysilicon layer extending transversly of said selected area for said device and to define at least one polysilicon conducting line on said second nitride layer over said field oxide and removing remaining portions of the polysilicon layer, said gate polysilicon layer defining first and second, remaining portions of said selected area corresponding to source and drain regions of said device and comprising the electrode of the gate of said device,







oxidizing the surfaces of said gate polysilicon layer and of said at least one polysilicon conducting line while retaining said second silicon nitride layer over said source and drain regions of device to prevent the formation of any substantial amount of thermal oxide on said source and drain regions,

removing exposed portions of said second silicon nitride layer by a material selective removal process including said silicon oxynitride layer formed thereon, thereby to expose the underlying said second silicon dioxide layer on said source and drain regions,

removing the portions of said second silicon dioxide layer uncovered by removal of said portions of said second nitride layer, thereby to expose the surface of said substrate at said source and drain regions of said device and provide self-aligned vias for contacts to said source and drain regions of said device.

4,455,738

SELF-ALIGNED GATE METHOD FOR MAKING MESFET SEMICONDUCTOR

Theodore W. Houston; Al F. Tasch, Jr., both of Richardson; Henry M. Darley, Plano, all of Tex., and Horng S. Fu, Sunnyvale, Calif., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 24, 1981, Ser. No. 334,405
Int. Cl.³ H01L *21/302, 21/265*
U.S. Cl. 29—571 **3 Claims**

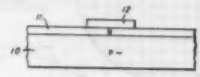
1. A method for fabrication of a MESFET device in which the gate is self-aligned in relation to the source/drain regions, comprising the steps of:

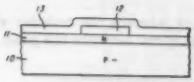
providing a first-conductivity-type region on a silicon substrate;

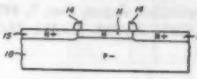
depositing on said first-type region first insulator material to define the gate area of said MESFET device, said first insulator being processed to form approximately vertical walls, said processed first insulator covering only that portion of the channel region which will underlie the gate;

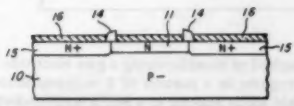
depositing a layer of second insulator material on the substrate and on the first insulator material;

etching anisotropically to remove said second insulator material, except for a filament section adjacent to said vertical walls of said first insulator material region;









introducing a first-type impurity to create highly doped first-type source and drain regions;

removing said first insulator material leaving only said filament sections of second insulator material;

depositing a layer of metal overall;

heat treating the structure to convert said metal in contact with said substrate to a metal silicide to create gate, source and drain contacts;

removing said metal not in contact with said substrate and not converted to silicide.

4,455,739

PROCESS PROTECTION FOR INDIVIDUAL DEVICE GATES ON LARGE AREA MIS DEVICES

Jaroslav Hynecek, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 19, 1982, Ser. No. 365,077
Int. Cl.³ H01L *21/90*
U.S. Cl. 29—571 **18 Claims**

1. A method for protecting individual device gates on a semiconductor slice during the device fabrication process, comprising:

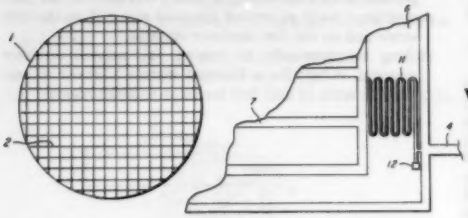
interconnecting the gates of a plurality of said individual devices on said slice; and

coupling said interconnected gates to a reference voltage through a resistive element such that charge can flow to and from the gates prior to dicing the slice into individual devices; and

dicing the slice into individual devices.

4. A method for protecting individual device gates on a

semiconductor slice during the fabrication process comprising the step of interconnecting the gates of a plurality of individual devices on said slice through individual resistive elements of



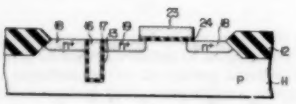
said individual devices wherein the resistive elements, gates and interconnection material between the gates are comprised of the same material.

4,455,740

METHOD OF MANUFACTURING A SELF-ALIGNED U-MOS SEMICONDUCTOR DEVICE

Hiroshi Iwai, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Continuation of Ser. No. 212,104, Dec. 2, 1982, abandoned. This application Sep. 29, 1982, Ser. No. 426,667
Claims priority, application Japan, Dec. 7, 1979, 54-158977
Int. Cl.³ H01L *21/308, 21/283, 21/22*
U.S. Cl. 29—571 **12 Claims**



1. In a method of manufacturing a gate electrode and source and drain regions in a portion of a semiconductor substrate between field oxide regions in a MOS semiconductor device, the improvement comprising the steps of:

(a) forming a groove substantially U-shaped in cross-section in a predetermined exposed portion of said semiconductor substrate where said gate electrode is to be located;

(b) forming a gate insulated film to cover the surface of said substrate inclusive of said groove;

(c) depositing a gate electrode material on said substrate to a thickness greater than one half the width of the opening of said groove to thereby fill said groove with said gate electrode material;

(d) forming a gate electrode by etching away said gate electrode material until said gate insulation film, except for a portion thereof within said groove, is exposed, thereby forming the gate electrode in a self-aligned manner, the gate electrode being substantially buried within the substrate such that the upper surface of the gate electrode is substantially even with or lower than the surface of the substrate surrounding the gate electrode; and

(e) forming source and drain regions between respective side portions of the field oxide regions and respective side portions of said groove filled with said gate material by diffusing an impurity utilizing said groove filled with said gate electrode material and said field oxide regions as masks to thereby form self-aligned source and drain regions substantially only within the substrate.

7. In a method of manufacturing both a self-aligned gate electrode and a non-self-aligned gate electrode and respective source and drain regions located in a portion of semiconductor substrate between field oxide regions in a MOS semiconductor device, the improvement comprising the steps of:

(a) forming a groove substantially U-shaped in cross-section in a predetermined exposed portion of said semiconductor substrate where said self-aligned gate electrode is to be located;

(b) forming a gate insulation film to cover the surface of said substrate inclusive of said groove;

(c) depositing a gate electrode material on said substrate to a thickness t expressed by the formula:

$$t \geqq (a/2) \tan (45° - \theta/2)$$

Wherein:

a=the width of the groove opening; and

θ=the angle at which the sides of the groove include to the vertical to thereby fill said groove with said gate electrode material, said thickness t being sufficient enough to preclude formation of a hole in said groove;

(d) simultaneously forming both a self-aligned gate electrode and a non-self-aligned gate electrode by (i) covering a first portion of said gate electrode material remote from said groove with a mask material, (ii) etching said gate electrode material until said gate insulative film, except for portions thereof beneath said mask material and over said groove, is exposed to thereby obtain a self-aligned gate electrode within said groove and a separate non-self-aligned gate electrode beneath said mask a substantial portion of the self-aligned gate electrode being buried within the substrate such that the upper surface of the gate electrode is substantially even with or lower than the surface of the substrate surrounding the gate electrode; and

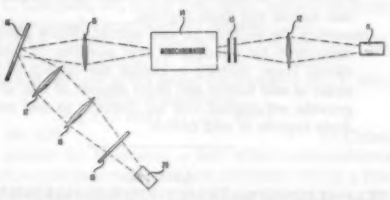
(e) forming source regions and drain regions in the substrate, within the surface area defined by respective side portions of said oxide field regions by diffusing an impurity utilizing said groove filled with said gate electrode material, said field oxide regions, and said separate non-self-aligned gate electrode as masks.

4,455,741

FABRICATION OF SOLID STATE ELECTRONIC DEVICES USING FLUORESCENT IMAGING OF SURFACE TEMPERATURE PROFILES

Paul R. Kolodner, Maplewood, N.J., assignor to AT&T Bell Laboratories, Murry Hill, N.J.

Continuation-in-part of Ser. No. 347,783, Feb. 11, 1982, abandoned. This application Oct. 15, 1982, Ser. No. 434,635
Int. Cl.³ H01L *21/66*
U.S. Cl. 29—574 **36 Claims**



1. A method for fabricating a solid state electronic device, comprising the steps of:

forming a layer of fluorescent material on a surface of a partially or fully completed solid state electronic device, the fluorescence of said material varying as the temperature of the underlying device varies;

exposing said material to energy which causes said material to fluoresce;

monitoring the fluorescence of said material while the solid state electronic device is contacted with a voltage and/or current source; and

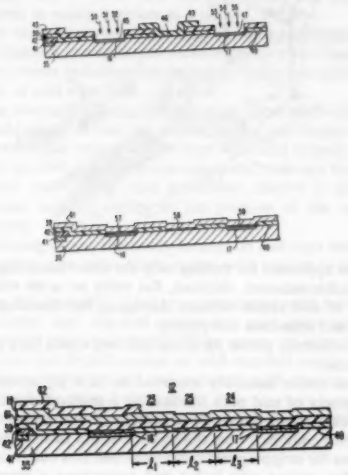
accepting, rejecting, or further processing said device in response to the monitored fluorescence.

4,455,742

METHOD OF MAKING SELF-ALIGNED MEMORY MNOS-TRANSISTOR

David W. Williams, Baltimore, and James R. Cricchi, Catonsville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 7, 1982, Ser. No. 385,200
Int. Cl.³ H01L 27/02, 21/26
U.S. Cl. 29—576 B 21 Claims



1. A method for self-aligning the variable threshold region between the drain and source of a memory transistor comprising the steps of:

forming a first layer of silicon oxide over a semiconductor substrate of silicon,

forming a second layer of silicon nitride over said first layer of silicon oxide,

forming first, second and third openings spaced apart through the first and second layers for the drain, variable threshold, and source regions respectively, of the transistor,

depositing first material suitable to form an implant barrier over said second opening region,

ion implanting impurities through said first and third openings to form the drain and source regions of the transistor,

removing said first material from above the second opening,

growing thermal oxide on the semiconductor substrate in the first, second and third openings,

forming a third layer of silicon nitride over the wafer,

forming fourth and fifth openings through the third layer of silicon nitride and thermal oxide to the drain and source regions respectively,

depositing conductive material over the third layer of silicon nitride and fourth and fifth openings, and

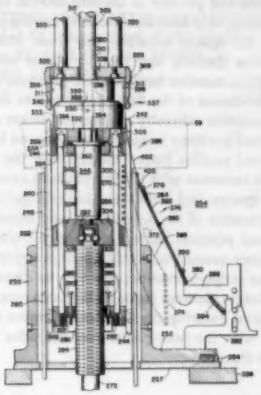
etching said conductive material to form drain and source contacts and a gate electrode overlying a path on said third layer from said drain region over said second opening to said source region.

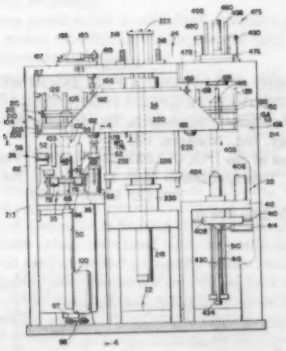
4,455,743

APPARATUS AND METHOD FOR PLACING COILS AND PHASE INSULATION IN THE SLOTS OF A DYNAMOELECTRIC MACHINE STATOR CORE MEMBER

Keith A. Witwer, Fort Wayne; Keith W. Moser, Roanoke, and Richard A. Sanderson, Fort Wayne, all of Ind., assignors to Industra Products, Inc., Fort Wayne, Ind.

Filed Aug. 17, 1981, Ser. No. 294,210
Int. Cl.³ H02K 15/06
U.S. Cl. 29—596 49 Claims





1. An apparatus for placing coils in the slots of an internally slotted dynamoelectric machine stator core member in which the slots are defined by radially inwardly extending teeth having inner ends which define a bore, the apparatus comprising a cylindrical array of elongated, circumferentially spaced blade elements for extending through the bore and respectfully to engage the inner ends of the stator core member teeth with the spaces between the blade elements communicating respectively with the core member slots, the blade elements respectively having distal ends and proximal ends, means for mounting the blade elements adjacent the proximal ends thereof, a stripper member axially movable within the array between retracted and extended positions and having portions extending into the spaces between the blade elements, and first power means including a drive rod for moving the stripper member toward its extended position thereby to engage the one end turn portion of a previously-wound coil placed over the distal ends of at least two blade elements with the one end turn portion of the coil within the array between the stripper mem-

ber and the distal ends, with the side portions of the coil respectively extending through two spaces respectively on either side of the two blade elements, and with the other end portion of the coil being disposed on the exterior of the array, and to push the one end turn portion through the core member bore so that the coil side portions enter a respective two of the core member slots, the improvement comprising: a phase insulation insertion member axially movable between a first position axially aligned with and spaced from the distal ends of the blade elements and a second position within the array between the one end portion of the coil and the distal ends of the blade elements, said insertion member having portions which extend into the spaces between the blade elements in said second position thereof; and second power means for moving said insertion member between said positions thereof independently of movement of the first power means drive rod and the stripper member whereby a phase insulation element having opposite end portions joined by two spaced leg portions may have one end portion thereof placed over the distal ends of the two blade elements with the leg portions extending through two of said spaces, and with the other end portion being disposed on the exterior of the array when said insertion member is in said second position thereof so that movement of said insertion member toward said first position thereof prior to movement of the stripper member toward the distal ends pulls the phase insulation element through the core member bore with the leg portions entering the two core member slots which communicate with the two spaces over the sides of previously inserted coils therein.

4,455,744

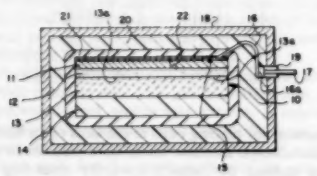
METHOD OF MAKING A PRECISION RESISTOR WITH IMPROVED TEMPERATURE CHARACTERISTICS

Felix Zandman, Philadelphia, Pa., assignor to Vishay Intertechnology, Inc., Malvern, Pa.

Division of Ser. No. 072,003, Sep. 4, 1979, Pat. No. 4,318,072. This application Mar. 1, 1982, Ser. No. 353,437

Int. Cl.³ H01C *17/00*

U.S. Cl. 29—610 R **10 Claims**



1. The method of manufacturing a resistor which includes a metal film constituting the resistive material, and a substrate to which the film is cemented, the method including the steps of

forming the substrate as a composite of at least two generally parallel portions, one portion being substantially rigid and the other being a plastic,

firmly cementing the resistive metal film to the surface of the rigid portion facing away from the plastic portion,

providing the plastic portion with a thickness which is of the same order of magnitude as that of the rigid portion,

subjecting the plastic portion to a curing operation at a temperature above the resistor operating range, and

adjusting the thickness of the plastic portion to fine tune the temperature coefficient of the resistor.

4,455,745

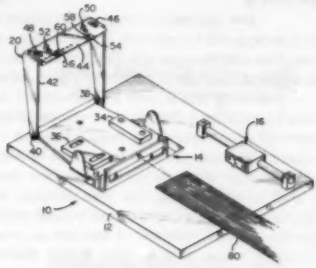
METHOD AND APPARATUS FOR TRIMMING SHIELDED CABLE

Thurston H. Toeppen, Poughkeepsie, N.Y., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jun. 7, 1982, Ser. No. 385,427

Int. Cl.³ H02G *1/12*; B26D *3/00*; B21F *13/00*

U.S. Cl. 30—90.6 **10 Claims**



1. An apparatus for cutting only the outer insulating jacket of a multiconductor, shielded, flat cable so as to enable removal of said jacket without damaging the shielding of the cable, said apparatus comprising:

a substantially planar jig means defining a path for a shielded cable;

a first cutter assembly mounted on said jig means transversely of said path for making a transverse cut in said jacket about the entire periphery of said cable, said cut being only part way through the depth of said jacket;

means for stripping said cable from said first cutter assembly after cutting said jacket and comprising a member attached to said jig means for limited relative movement and having a planar portion parallel to and spaced slightly from said first cutter assembly, an elongated slot in said member through which said cable must pass for access to said first cutter assembly, said member restraining said cable from following said first cutter assembly in an opening direction; and

a second cutter assembly mounted on said jig means for making a longitudinal cut in said jacket.

4,455,746

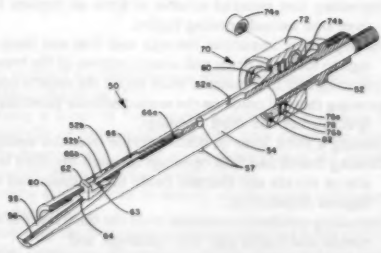
TUBE CUTTER

Joseph J. Idzik; Charles H. Kouse, and James L. Herzog, all of Springfield, Ohio, assignors to Elliott Turbomachinery Company, Inc., Jeannette, Pa.

Filed Sep. 16, 1982, Ser. No. 418,864

Int. Cl.³ B23D *21/14*

U.S. Cl. 30—106 **4 Claims**



1. A tube cutter comprising:

a generally cylindrical cage means having a bore and a pair

of axially spaced axially extending slots formed therein and of a diameter less than that of the internal diameter of a tube to be cut;

a mandrel means slidably received in said bore and having a first end terminating in a sloped surface having a groove formed therein;

dowel means diametrically extending from said mandrel means and extending into a first one of said slots and coacting therewith to limit the extent of relative axial movement between said cage means and said mandrel means and to cause said mandrel means and said cage means to rotate together as a unit;

cutter blade means having a sloped surface and tongue complimentary to said sloped surface and groove of said mandrel means and extending at least partially into said second one of said slots from said bore;

spring means engaged with said cage means and said cutter blade means to bias said sloped surface and tongue of said cutter blade means into contact with said sloped surface and groove of said mandrel means and to secure the cutter blade means from axial movement relative to the cage means without regard to the position of the mandrel means;

positioning means adjustably located on said cage means for locating said cutter blade means with respect to the tube to be cut;

means for producing relative reciprocating axial movement between said mandrel means and said cage means to thereby cause said cutter blade means to slide up and down said sloped surface of said mandrel means and to move radially inward and outward with respect to said second one of said slots; and

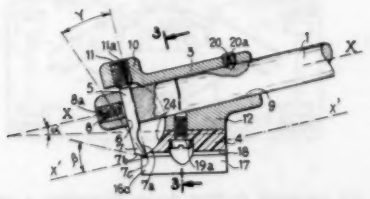
driving means for rotating said mandrel means, said cutter blade means and said cage means as a unit.

4,455,747

HAND TOOL FOR REMOVING MATERIAL FROM A PART, ESPECIALLY DEBURRING OR BREAKING ANGLES

André Carossino, 88 route de la Princesse, 78430 Louveciennes, France

Filed Sep. 16, 1982, Ser. No. 418,745
Claims priority, application France, Sep. 22, 1981, 81 17863
Int. Cl.³ B26B *3/00*
U.S. Cl. 30—171 **11 Claims**



1. A hand tool useable for deburring and chamfering a workpiece, said hand tool comprising:

a handle having a free end;

a cutting tool having a cutting edge at an intersection of a draft face and a front face;

means for removeably securing said cutting tool to said handle such that said cutting edge is substantially perpendicular to a longitudinal axis of said handle;

bearing means for guiding said cutting tool along said workpiece and for providing a fulcrum, between said handle free end and said cutting edge, about which said hand tool is pivotal to vary engagement of said cutting tool with said workpiece during use of said hand tool, said bearing means straddling a portion of said workpiece and comprising two faces, each face defining a face plane, and a slot aong a line defined by insection of said face planes; and

mount means for removeable mounting of said bearing means on said handle and for adjustable setting of said cutting tool relative to said bearing means faces,

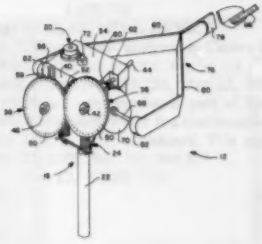
whereby said slot accommodates an edge of a workpiece sheet and said faces accommodate intersecting surfaces of a workpiece corner such that different workpiece contours are workable by the same tool.

4,455,748

POSITION LOCATING APPARATUS AND METHOD

John W. Rick, 8 Cleland Pl., Menlo Park, Calif. 94025

Filed Jun. 11, 1982, Ser. No. 387,591
Int. Cl.³ G01B *5/14*
U.S. Cl. 33—1 CC **3 Claims**



1. An arrangement for plotting the provenience of an archaeological artifact with respect to a fixed reference point, said arrangement comprising:

(a) an apparatus including

(i) first means positionable at said fixed reference point,

(ii) second means movable to the location of said artifact from a given starting point, and

(iii) third means connected with said first and second means and responsive to the movement of said second means to said artifact location from its given starting point for indicating the position of said artifact location within a specific spherical coordinate system having said fixed reference point as its origin and including the coordinates ρ, θ, ϕ, said third means including individual means respectively responsive to said movement of said second means for indicating the particular ρ, θ and ϕ coordinate values associated with the particular location of said artifact, said θ indicating means including a first indicating dial, means for supporting said dial for rotation, and means responsive to the horizontal angular component of movement of said second means about said fixed reference point for rotating said dial in a way which corresponds to said horizontal angular component and therefore the θ coordinate value associated with the particular location of said artifact, said ϕ indicating means including a second indicating dial, means for supporting said second dial for rotation, and means responsive to the vertical angular component of movement of said second means about said fixed reference point for rotating said second dial in a way which corresponds to said vertical angular component and therefore the ϕ coordinate value associated with the particular location of said artifact, and said ρ indicating means including a retractable, laterally rigid tape measure, and means for connecting one end of said tape measure with each of said θ and ϕ dial rotating means so that the other end of said tape measure serves as said second means movable to the location of said artifact from a given starting point, the straight-line distance between the ends of said tape measure corresponding to the ρ coordinate value associated with the particular location of said artifact; and

(b) means cooperating with the first means of said apparatus for fixedly supporting said first means at said reference point, whereby said apparatus can be used for plotting the provenience of various archaeological artifacts with respect to said reference point by indicating the position of each within said coordinate system.

4,455,749

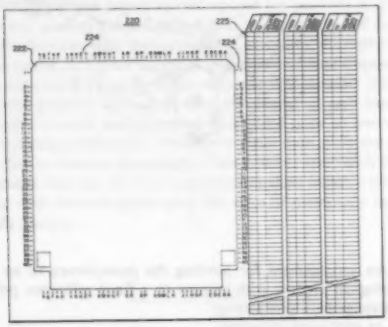
MATRIX BOARD

C. Michael Hayward, 23 Jacob Gates Rd., Harvard, Mass. 01451

Division of Ser. No. 64,372, Aug. 7, 1979, Pat. No. 4,330,684, which is a continuation-in-part of Ser. No. 864,457, Dec. 27, 1977, abandoned. This application Oct. 26, 1981, Ser. No. 314,578

Int. Cl.³ G09B *29/00*

U.S. Cl. 33—1 B **3 Claims**



1. A system for designing prototype electrical circuits on a matrix board of the type comprising an insulated mounting board having a plurality of apertures extending through said board between the first and second surfaces of the board, a plurality of electrical conductors physically mounted on the first or second surface of said board, and a coordinate system including indicia for identifying locations on said board, said system comprising, in combination:

an assembly master in the form of a light-transmitting sheet having disposed thereon (1) an outline of said matrix board, and (2) a coordinate system which is substantially identical to the coordinate system carried on said matrix board; and

a location grid in the form of a sheet having disposed thereon (1) an outline of said matrix board dimensioned substantially identically to the outline disposed on said master, (2) a coordinate system substantially identical to that carried on said assembly master, (3) first indicia substantially corresponding to the location of each aperture in said matrix board and (4) second indicia substantially corresponding to the location of each electrical conductor on said matrix board.

4,455,750

DRAFTING TOOL FOR PARALLEL LINES

Arthur C. Sturz, 85 Hemlock La., Santa Barbara, Calif. 93111

Filed Jul. 29, 1982, Ser. No. 403,078

Int. Cl.³ B43L *13/02*; B43K *27/00*

U.S. Cl. 33—43 **9 Claims**

1. A drafting tool for marking parallel lines at variable spacings between the lines comprising:

(a) a pair of legs pivoted together for movement through an arc, one of said legs normally being stationary and the other moving through said arc, said arc movement defining a plane;

(b) a bar carried by said other leg;

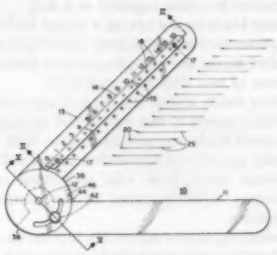
(c) means for securing the bar to said other leg with movement toward and away from said plane;

(d) resilient means engaging the bar and said other leg to normally urge the bar away from said plane;

(e) and a plurality of markers carried by said bar and normally spaced from the plane,

whereby manual movement of the bar toward the plane will cause the markers to engage the plane to leave indicia.

8. A drafting tool for marking parallel lines on a surface at variable spacings between the lines comprising:



(a) a stationary leg adapted to rest on the surface;

(b) a bar pivoted to the leg;

(c) markers projecting from the bar toward the surface;

(d) and means for resiliently spacing the bar from the surface,

whereby a manual pressing of the bar toward the surface will overcome the resilient means and cause the markers to make indicia on the surface.

4,455,751

AUTOMATIC DRAFTING DEVICE

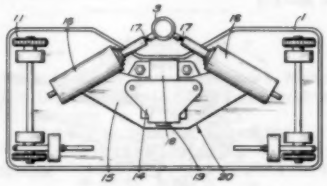
Kurt Held, Alte Str. 1, D-7218 Trossingen 2, Fed. Rep. of Germany

Filed Feb. 11, 1982, Ser. No. 347,968

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1981, 3104962; Nov. 6, 1981, 3144057

Int. Cl.³ G01D *9/00*; B43L *13/02*

U.S. Cl. 33—18 R **10 Claims**



1. An automatic drafting device comprising a carriage, means mounting said carriage for movement over a planar drafting surface, a controllable writing device including a stylus holder supported on said carriage, a writing tip supported in and extending from said stylus holder, said controllable writing device including a pressure regulation device on said carriage for regulating the pressure applied to said stylus holder for effecting writing on the drafting surface, said pressure regulating device includes a pivot unit located on said carriage, said pivot unit includes leaf springs, a pair of hollow shaft motors each having a threaded spindle mounted on said leaf springs, said hollow shaft motors being spaced apart and said threaded spindles thereon each extend toward said stylus holder from a different angle and support said stylus holder at angularly spaced locations thereon, a direct current motor having an eccentric disc in operative connection with said

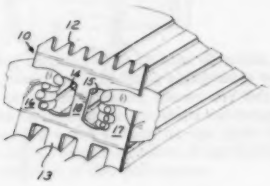
pivot unit for raising and lowering said stylus holder, a toothed rack arranged to be located on and to extend along the planar drawing surface and said means for mounting said carriage comprises toothed wheels in meshed engagement with said rack.

4,455,752

CHILDREN'S TOYS AND PARTICULARLY SAND TOYS

Katherine Koulouras, 24000 Lahser Rd., Southfield, Mich. 48034

Filed Aug. 11, 1982, Ser. No. 407,179
Int. Cl.³ B43L *11/04*; A63H *33/00*
U.S. Cl. 33—41 D **6 Claims**



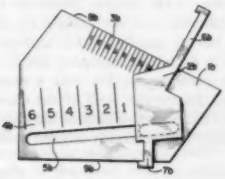
1. A sand toy comprising
a generally planar body,
said body having at least one edge with a plurality of serrations along said edge,
said body having spaced side edges,
said body having spaced finger engaging openings, the shape of and distance between the openings being such that the sand toy can be grasped both with the fingers engaging the openings and the thumb spanning the portion of the body between said openings, or alternatively, with the fingers of each hand engaging a respective opening and the associated thumb spanning the portion of the body between the respective opening and the respective side edge in order to move the sand toy to bring the serrations into contact with sand and the like.

4,455,753

THICKNESS GAUGE

Barry E. Keyes, Box 97, New Preston, Conn. 06777

Filed Mar. 1, 1982, Ser. No. 353,348
Int. Cl.³ G01B *3/20, 5/02*
U.S. Cl. 33—143 E **2 Claims**



1. A gauge having two members one moveable relative to the other and having a straight edge portion thereon, a straight scale on said member having the straight edge portion, and at an angle to said straight edge, the other member having at least one gauge portion moveable at an angle relative to said straight scale wherein relative movement between the members indicates on the gauge the relative distance between the straight edge portion and the gauge portion.

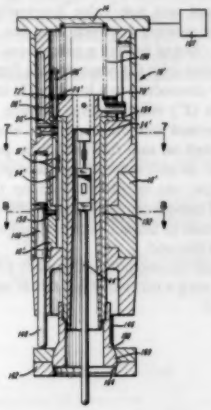
2. A gauge having a first component and another component which are slideably, moveably connected to one another, wherein said first component has a straight scale thereon and wherein said other component slides relative to the first component, the sliding movement of the first component relative to the other component being at an angle to the straight scale on the first component, the other component having a gauge end portion extending beyond said first component which gauge end portion approaches said first component when said other component slides relative to the first component in one direction and which other component also has a scale portion displaced from said gauge end portion which cooperates with said straight scale to indicate the relative distance between the gauge end portion and the first component.

4,455,754

POSITION SENSING DEVICE

Harry L. Benjamin, Dayton, Ohio, assignor to Centro Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 152,220, May 22, 1980, Pat. No. 4,328,621, which is a continuation-in-part of Ser. No. 109,722, Jan. 4, 1980, abandoned, which is a continuation-in-part of Ser. No. 843,414, Oct. 9, 1977, abandoned. This application Feb. 23, 1982, Ser. No. 349,877
Int. Cl.³ G01B *7/30*
U.S. Cl. 33—174 L **6 Claims**



1. A position sensing device, comprising:
a support member;
at least two angular position sensing probes movably mounted in spaced relation in said support member and extending therefrom to be engagable with an external surface, each said probe having a camming surface;
a plurality of camming members movably mounted in said support member and each having a cam follower end engaging a respective said camming surface of said probes;
a plurality of flexible members each engaging a respective camming member so as to be flexed by movement of said camming members upon movement of an associated probe;
means mounted on each said flexible member for providing electrical signals indicative of the amount of bending thereof in response to movement of an associated probe; and
means receiving said signals and providing an indication of the relative angular position of said support member to said external surface.

4,455,755

APPARATUS FOR SENSING TEST VALUES AT TEST SAMPLES

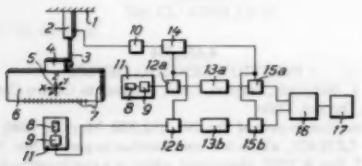
Rainer Fritsche, Braunfels; Hans-Dieter Jacoby, Werdorf, and Erich Schüster, Hüttenberg, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Continuation of Ser. No. 183,725, Sep. 3, 1980, abandoned. This application Sep. 14, 1982, Ser. No. 418,048

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1979, 2937431

Int. Cl.³ G01B 7/02

U.S. Cl. 33—174 L 11 Claims



1. An apparatus for sensing a test value at a test sample (4) comprising:

(a) an elastically supported mechanical sensor (3) which moves relative to said test sample;

(b) at least one test value transmitter (11) detecting the relative motion between said test sample (4) and said sensor (3) and having a subsequent counter (9);

(c) a flexible joint (2) comprising a first portion (2') which is rigidly connected to a housing (1) and a second one-piece portion (2") which moves relative to said fixed portion, said second one-piece portion elastically and movably supported on said first one-piece portion, said sensor (3) located on said second one-piece portion;

(d) at least one oscillation pick-up (10) mounted on said second one-piece portion, said pick-up emitting a signal at the instant of impact between said sensor (3) and said test sample (4); and

(e) at least one memory (13a, 13b) activated by said signal and storing a test value present at said test value transmitter (11).

4,455,756

DEVICE FOR HANGING PICTURES

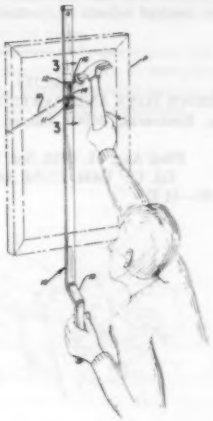
Gordon D. Greene, 787 Prospect Ave., Winnetka, Ill. 60093

Filed Dec. 24, 1981, Ser. No. 334,125

Int. Cl.³ A47G 1/20, 1/17

U.S. Cl. 33—180 R 1 Claim

1. A device for hanging pictures comprising a relatively thin elongated member, an opening extending through said member and equipped with ledge means for supporting a picture hook, a hook positioned in said opening and rupturable tape means engaging said hook and member to stabilize said hook in said opening, said member being equipped with a flat surface for engaging a wall on which a picture is to be hung, said tape means being applied to said surface and providing an adhesive surface exposed by said ledge means is stabilized by said adhesive and upon fastening to said wall remains in position upon removal of said device and attendant rupturing of said tape means, said member being equipped adjacent the bottom thereof with a portion offset from said flat surface to provide a



manual grasping portion while positioning said flat surface against a wall.

4,455,757

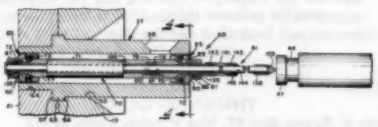
PLUNGER ALIGNMENT FITTING AND METHOD FOR COLD CHAMBER DIE CASTING MACHINE

William H. Schwartz, 2111 Acacia Park Dr., Lyndhurst, Ohio 44124

Filed Feb. 3, 1982, Ser. No. 345,414

Int. Cl.³ G01B 5/25

U.S. Cl. 33—181 R 39 Claims



1. A plunger alignment fitting for a machine including a chamber and a plunger movable in the chamber such as a die casting machine or the like, said fitting comprising an axial center indicator for the plunger, alignment means for mounting said center indicator and receivable in the chamber, said alignment means having axially spaced, tapered shoulders in axial alignment with each other and said center indicator, and centering means each engageable with a respective one of said shoulders and the interior wall of the chamber for centering said shoulders to respective ends of the chamber, whereby said center indicator will be axially aligned with the chamber.

4,455,758

BEARING MEANS FOR ANGLE MEASURING INSTRUMENTS

Yasuo Iwafune, and Yuji Kobayashi, both of Tokyo, Japan, assignors to Tokyo Kogaku Kikai Kabushiki Kaisha, Japan

Continuation of Ser. No. 242,281, Mar. 10, 1981, abandoned. This application Apr. 20, 1983, Ser. No. 486,871

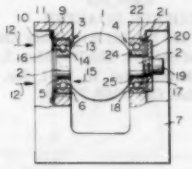
Claims priority, application Japan, Mar. 12, 1980, 55-31336; Mar. 17, 1980, 55-34738[U]

Int. Cl.³ G01C 1/02; F16C 35/04

U.S. Cl. 33—282 6 Claims

1. An angle measuring instrument including a housing containing a viewing optical system, a pair of shafts provided at the opposite sides of said housing, support frame means, said

shafts being respectively mounted on said support frame means through ball bearing means so that said housing can be swung in a vertical plane, said ball bearing means including inner race means, outer race means, and bearing ball means between said inner and outer race means; one of said outer race means being supported by said support frame means in a radial direction



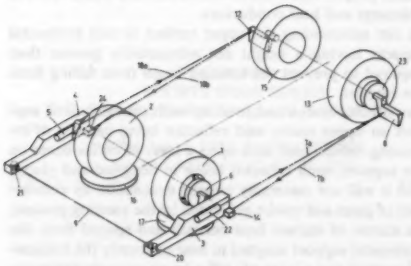
without being constrained in an axial direction, said support shafts being respectively in fitting engagement with said inner race means of said ball bearing means, and bias means being engaged with one of said support shafts and being pressed by a retaining member which is fixed on said shaft for applying a preload to said one outer race means of said ball bearing means in an axial direction of the shaft means.

4,455,759

APPARATUS FOR MEASURING THE ALIGNMENT OF THE FRONT AND REAR WHEEL SYSTEMS OF AUTOMOTIVE VEHICLES AS WELL AS THE SETBACK ANGLES BETWEEN THE WHEELS OF THE FRONT SYSTEM AND THE SIDE-SLIP ANGLE

Paul A. Coetsier, Lagny, France, assignor to Etablissements M. Muller et Cie, Paris, France

Filed Jan. 19, 1982, Ser. No. 340,694
Claims priority, application France, Jan. 20, 1981, 81 00944
Int. Cl.³ G01B *11/26*
U.S. Cl. 33—288 **2 Claims**



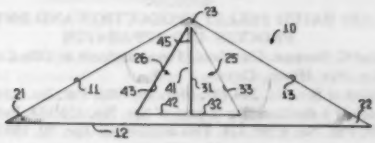
1. Apparatus for measuring the alignment of the front and rear wheel systems of automotive vehicles as a function of the axis of thrust of a vehicle as well as the dynamic setback angle between the wheels of the front system, comprising an arm attached laterally to each front wheel and means on each arm for defining a reference straight line which connects two fixed points located one on each arm, an emitter for a light beam which is parallel to the plane of the corresponding front wheel and directed toward the rear wheel located on the same side of the vehicle, and a mirror carried by said rear wheel for reflecting the light beam onto a photosensitive cell mounted on the corresponding arm, said means for defining a reference straight line comprising angular displacement pickups on the front ends of the arms and connected to each other by a tensioning wire, and for each rear wheel a photosensitive cell mounted above the mirror at a distance from the mid-plane of each wheel which is equal in the case of both rear wheels, the light beams being spaced apart a greater distance than the last-named photosensitive cells whereby the light beams impinge alternately on the last-named photosensitive cells when the front wheels are turned in either direction.

4,455,760

TRIANGLE

Milton G. Arceneaux, Jr., 4434 Herrmann St., Metairie, La. 70002

Filed Jul. 15, 1983, Ser. No. 514,086
Int. Cl.³ B43L *7/00*
U.S. Cl. 33—482 **24 Claims**



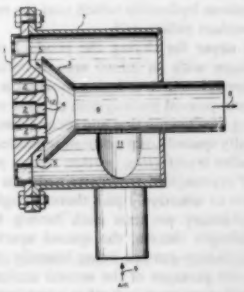
1. A triangle specifically adapted for drafting isometric drawings comprising a generally planar body having a periphery bounded by three edges with adjacent edges setting-off an associated corner, two of said corners having an included angle of 30 degrees and a remaining corner having an included angle of 120 degrees, means within said periphery for forming at least one opening defined by an edge having at least one straight edge portion, said one straight edge portion and the most adjacent of the edges defining said 120 degree corner defining therebetween an acute angle opening in a direction away from said 120 degree corner, and said one straight edge portion being normal to the most remote of the edges defining said 120 degree corner.

4,455,761

PNEUMATIC POLYMER EDUCTOR CONVEYOR DRYER

Robert D. Terhune; George L. Bazin, II; James H. Long, and Linh V. Nguyen, all of c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Filed Nov. 12, 1981, Ser. No. 320,820
Int. Cl.³ F26B *5/14*
U.S. Cl. 34—14 **28 Claims**



1. An apparatus for drying water-wet rubbers comprising in cooperative sequential association:

a die plate with an inlet side, a discharge side, and multiple orifices penetrating through said die plate suitable for extruding a wet rubber, funnel receiver means having a large open end and a truncated smaller end, said large open end spaced slightly away from and closely surrounding said die plate discharge side, said truncated small end sealably connected to a funnel discharge means,

a closed chamber surrounding said discharge side of said die plate and said receiver means, containing a single outlet opening sealably surrounding said funnel discharge means, and tangentially positioned inlet for air positioned for tangential inlet of said air to said chamber generally parallel to and spaced substantially and away from said die plate face and effective to create an air vortex across said die plate face upon inlet of air stream, and rubber collector means for receiving rubber from said funnel discharge means.

4,455,762

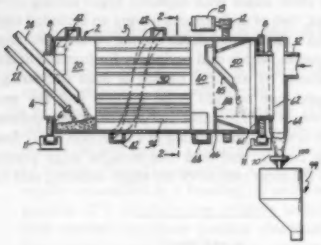
GLASS BATCH PELLET PRODUCTION AND DRYING PROCESS AND APPARATUS

Walter C. Saeman, Cleveland, Tenn., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 244,457, Mar. 16, 1981, Pat. No. 4,349,366, which is a continuation-in-part of Ser. No. 123,153, Feb. 21, 1980, Pat. No. 4,293,324. This application Apr. 30, 1982, Ser. No. 373,460

Int. Cl.³ F26B 9/06

U.S. Cl. 34—170 5 Claims



1. Apparatus for producing and drying layered pellets for glass production comprising in combination:

a. a rotary drum with a pelletizing zone, a drying zone, a recycle zone and recycle means to recycle undersized pellets from the recycle zone to the pelletizing zone, the pelletizing zone being adapted to maintain a moving bed of recycled pellets and feed thereinto sand, particles of a calcium carbonate source and a Na_2O source comprised of sodium hydroxide which coat the recycled pellets to form product pellets and;

b. a dryer for drying the product pellets having a dryer frame with an infeed area, a bottom receiving area up through which a drying medium is forced, an outlet, and an improved grate system integral with the bottom receiving area having first and second stationary generally vertically spaced apart portions separated by the third movable pellet transferring portion with a predetermined number of openings of predetermined area therein to permit pellets to selectively pass therethrough, the first and second stationary portions each having laterally spaced apart passages therein, the spaced apart passages of the first stationary portion being laterally offset from the spaced apart passages of the second stationary portion, the first stationary portion further overlying the second stationary portion and the third movable pellet transferring portion such that at least one half of the predetermined area of the pellet transferring portion openings is covered at any time, the uncovered pellet transferring openings being underlain by the second stationary portion so that the pellets are supported thereby until the third movable pellet transferring portion is moved laterally to thereby scrape the pellets into the passages in the second stationary portion to permit the pellets to exit the dryer through the outlet while additional overlying pellets descend to fill the pellet transferring openings of the third movable pellet transferring portion.

4,455,763

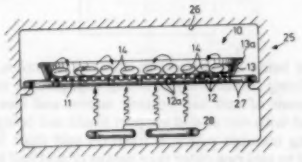
COFFEE ROASTER

Franklin R. Elevitch, 430 Nevada Ave., Palo Alto, Calif. 94301

Continuation-in-part of Ser. No. 240,757, Mar. 5, 1981, Pat. No. 4,425,720. This application Jul. 10, 1981, Ser. No. 282,153

Int. Cl.³ F26B 25/18

U.S. Cl. 34—233 3 Claims



1. A roaster adapted to roast green coffee beans which comprises:

(a) a horizontal support formed by a sheet of non-combustible heat conductive material formed with a multiplicity of openings which are small enough to retain a thin layer of coffee beans on the upper surface of the support, the number, pattern and area of the openings being such that radiant heat and hot air will pass freely and uniformly through the support,

(b) said horizontal support having an upper surface and a lower surface and being formed beneath the lower surface with projecting portions of the material of the support which project below the lower surface and which serve as chimneys and heat conductors,

(c) a rim surrounding the upper surface of said horizontal support having a height not substantially greater than required to prevent the roasting beans from falling from the support,

(d) a reflector above and forming with the horizontal support an upper space, said reflector being capable of reflecting radiant heat back upon a layer of coffee beans on the support, such reflector being so designed and placed that it will not materially impede evacuation by convection of gases and smoke generated by the roasting process,

(e) a source of radiant heat beneath and spaced from the horizontal support adapted to heat uniformly the horizontal support and a layer of coffee beans supported thereon,

(f) there being a lower space between the horizontal support and the source of radiant heat which is substantially unobstructed,

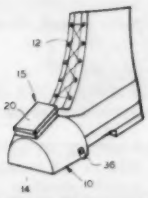
the design and configuration of the horizontal support, the reflector and the source of radiant heat being such that during roasting of coffee beans on the horizontal support air heated by the source of radiant heat moves freely, uniformly and directly upwardly from the source of radiant heat through the lower space, the horizontal support and the layer of coffee beans into the upper space and thence out of the roaster, such movement being induced substantially solely by the source of radiant heat whereby the green coffee beans are heated by the combination of radiation, conduction and convection to their isothermal point, moisture is evaporated from the beans at such isothermal point and the temperature of the dried beans then rises to effect roasting of the beans and development and retention of a desirable flavor.

4,455,764

MOUNTABLE WARMING CAP FOR A SHOE OR BOOT

Harold E. Rock, R.R. 2, Box 452, Berrien Springs, Mich. 49103, and Stephen E. Palen, R.R. 1, Box 185, New Buffalo, Mich. 49117

Filed Jun. 8, 1982, Ser. No. 386,220
Int. Cl.³ A43B 7/02, 13/22, 13/14, 23/00
U.S. Cl. 36—136 6 Claims



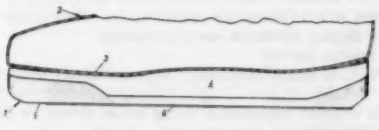
1. A warming cap mountable on the toe of a shoe or boot, said cap comprising a main body portion having an inner core of flexible, heat conductive material capable of being conformed to the shape of the toe of the boot on which it is mounted, a receptacle mounted on a upper surface of the main body portion for retaining a heat source, the receptacle comprising an elongated body portion having respective side walls and end walls extending upwardly from the main body portion of the device, and including a cover hinged on the receptacle to retain a heat source therein and to permit access to the interior thereof to replace such heat source as needed, and the heat source provided for heating the inner core of the device and thereby warming the boot and the foot contained therein.

4,455,765

SPORTS SHOE SOLES

Lars E. G. Sjöswärd, Hallekullevagen 16, S-430 80 Hovas, Sweden

Filed Jan. 6, 1982, Ser. No. 337,384
Int. Cl.³ A43B 13/12, 13/04, 5/10
U.S. Cl. 36—30 R 3 Claims



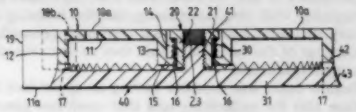
1. An improved sole for sports shoes, such as tennis shoes, comprising an insole adapted to be affixed to an upper, a midsole depending from said insole and formed of a comparatively soft, compressible and resilient material, and an outsole depending from said midsole and having a lower face for contacting the surface upon which the wearer is moving, the improvement comprising said lower face comprising a central portion terminating inwardly of the outer periphery of said lower face, said central portion consisting of a compressible and resilient material possessing a high coefficient of friction, preferably rubber, the remainder of said lower face of said outsole being formed from a compressible and resilient material that is harder than the material of said midsole and having a lower coefficient of friction than said central portion.

4,455,766

SPRING-LOCKED ROTATABLE HEEL

Harry E. Rubens, 2 Sutton Pl. South, New York, N.Y. 10022

Filed Nov. 30, 1981, Ser. No. 326,030
Int. Cl.³ A43B 21/24, 21/30
U.S. Cl. 36—39 7 Claims



1. A heel comprising a heel base element, a rotatable wear element connected to the heel base element, and a resilient connector having two ends, one of which is continuously connected to the heel base element, and the other end connected to the wear element to permit rotation thereof with respect to the heel base element, said resilient connector being spring-loaded to force a resilient contact between the wear element and the heel base element at all times during the use of the heel, said connector being sufficiently resilient to permit manual separation of the contacting elements axially for relocating the position of the wear element with respect to the heel base element during the further use of the heel, and complementary fastening means having two ends, one end non-rotatably mounted with respect to the base element, and the other non-rotatably mounted with respect to the wear element.

4,455,767

SHOE CONSTRUCTION

Charles Bergmans, Sprang-Capelle, Netherlands, assignor to Clarks of England, Inc., Norwalk, Conn.

Filed Apr. 29, 1981, Ser. No. 258,580
Int. Cl.³ A43B 13/18, 13/04; A43C 13/08
U.S. Cl. 36—83 20 Claims

1. An improved shoe construction to be worn on a human foot comprising:

an inner lining including a forward inner sole for underlying and that conforms generally to the contour of the lower surfaces of the toes and a forward portion of the sole of said foot, a rearward inner sole for underlying and that conforms generally to the contour of the lower surfaces of a rearward portion of the sole and the heel of said foot, and inner sides for lying adjacent and conforming generally to the side and upper surfaces respectively of the heel and the instep of said foot, said inner sides being folded upwardly and joined to said rearward inner sole at the periphery of said rearward inner sole;

an outer covering including a forward outer and upper section for overlying and that conforms generally to the contour of the upper surfaces of said toes and said forward portion of said foot, and a rearward outer and upper section lying adjacent said inner sides of said inner lining, lower edges of at least said forward section of said outer covering being joined to said inner lining at least at the periphery of said forward inner sole, said outer covering together with said inner lining thereby forming as a unitary structure a foot bag that conforms generally to the contour of the surfaces of said foot to be covered by said construction; and

a flexible outer sole member having an upper foot bed surface also for underlying and that conforms generally to the contour of said lower surfaces of said toes, said forward and rearward portions of the sole, and said heel of said foot and being bonded to said forward and rearward inner soles of said inner lining, and a peripheral side wall having an inwardly facing surface that extends upwardly and continuously from said foot bed surface and is bonded to surfaces of said outer covering immediately adjacent said lower edges and over the juncture of said lower edges and the periphery of said forward inner sole of said inner lining to thereby conceal said juncture.

4,455,768

SKI BOOT WITH FLEX CONTROL

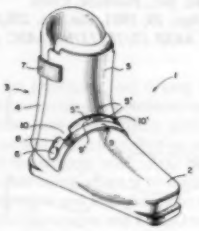
Georges P. J. Salomon, Annecy, France, assignor to Etablissements Francois Salomon Et Fils S.A., Annecy, France

Filed Apr. 17, 1981, Ser. No. 255,176

Claims priority, application France, Apr. 17, 1980, 80 08948; Jun. 18, 1980, 80 13822

Int. Cl.³ A43B 5/04

U.S. Cl. 36—121 **46 Claims**



1. A ski boot comprising a shank and a rigid shell base, and flexion means for exerting flexional forces from said shank on said shell base, said flexion means being generally positioned at the lower portion of said shank and comprising:

(a) first support means associated with said shank;

(b) second support means associated with said shell base wherein said second support means comprises a flexion fold band, said first and second support means forming at least one groove therebetween; and

(c) transmission means for transmitting flexional forces exerted by the leg of a skier on said shank from said first support means to said second support means.

4,455,769

SKI BOOT

Felix Fritsch, Vienna, Austria, assignor to Koflach Sportgerate Gesellschaft m.b.H., Koflach, Austria

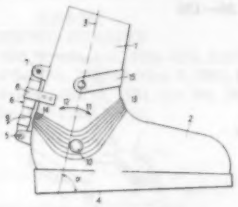
Filed Oct. 15, 1981, Ser. No. 311,652

Claims priority, application Austria, Oct. 16, 1980, 5140/80

Int. Cl.³ A43B 5/04

U.S. Cl. 36—121 **14 Claims**

1. A ski boot comprising a leg pivotally linked to a shell and a means for limiting the pivotal movement of the leg relative to the shell, particularly in combination with an inner boot characterized in that the boot leg is linked to the boot shell for free pivotal movement and in that the means for delimiting the pivotal movement of the boot leg includes a resilient and damping element in the form of a double acting piston and cylinder aggregate which is pivotally fixed beween the boot



leg and the boot shell on the boot leg and on the boot shell, the piston and cylinder aggregate have working spaces containing elastomeric synthetic plastics materials whose cross-sectional shape is, in a neutral position of the boot leg relative to the boot shell only incompletely fills the volume of the working spaces.

4,455,770

TRENCHER POWER CONTROL SYSTEM

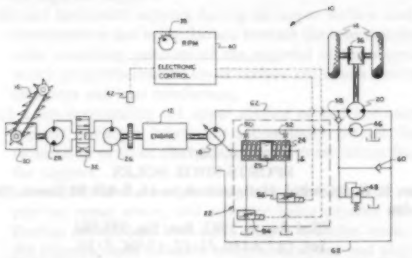
Glen T. Presley, 200 W. Industrial Dr., Angola, Ind. 46703

Continuation-in-part of Ser. No. 139,864, Apr. 14, 1980, Pat. No. 4,337,587. This application Jul. 6, 1982, Ser. No. 395,576

The portion of the term of this patent subsequent to Jul. 6, 1999, has been disclaimed.

Int. Cl.³ E02F 5/06

U.S. Cl. 37—86 **2 Claims**



1. A trencher control system which varies the vehicle drive speed so as to maintain a preset torque on the digging chain as the digging conditions vary, comprising:

a prime mover;

a drive means connecting the prime mover to the digging chain;

a variable displacement pump means driven by the prime mover;

a stroker control means attached to the pump means to control the pump displacement level, including a stroker control cylinder having at least one working chamber defined by a piston in said cylinder which is spring-biased toward a neutral zero flow position; a charge pump connected to said chambers of the cylinder, a fixed orifice positioned between the charge pump and each chamber; a drain line connecting each chamber to drain, a solenoid controlled valve means positioned in each of said drain lines which varies the pressure level in said chambers;

a vehicle drive motor connected to the drive wheels of the trencher, said motor being driven by said pump means;

RPM sensing means on the prime mover;

an electronic control means which controls the solenoid of the valve means, the control means receives a signal from

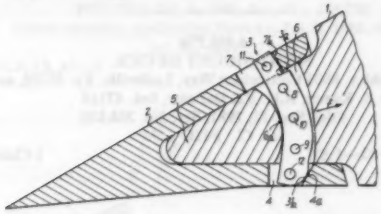
the prime mover RPM sensing means and compares the signal with an adjustable reference, if the signal received is less than the reference, the control means signals the solenoid to decrease the pressure level in the working chamber and decrease the pump displacement; if the signal is greater than the reference, the control means signals the solenoid to increase the pressure level in the working chamber and increase the pump displacement and further load the prime mover, whereby the control means maintains the prime mover at its peak torque output regardless of changes in the digging conditions.

4,455,771

SHOVEL EXCAVATOR BUCKET TEETH

André Poncin, Route de Warnécourt, 08000 Prix Les Mezieres, France

Continuation of Ser. No. 347,712, Feb. 10, 1982, abandoned. This application Jul. 29, 1983, Ser. No. 517,934
Claims priority, application France, Feb. 16, 1981, 81 02972
Int. Cl.³ E02F 9/28
U.S. Cl. 37—142 A **2 Claims**



1. A fixation device for a hollow removable wear-resisting tooth, said tooth having first and second apertures formed therein and each said aperture having side walls, said tooth being disposed on a nose portion of a support member having a curved channel formed therein having side walls, and wherein said device comprises:

a resilient curvilinear pin having at least three side waves and fitted within said curved channel and extending through said first and second apertures such that said at least three side waves enhance locking of said pin in position wherein said tooth and said support each comprise first and second laterally disposed opposing side walls, wherein said channel comprises a front wall and a rear wall, wherein said walls of said first and second apertures and said side walls of said channel each comprise first and second laterally disposed opposing side walls substantially parallel with said first and second side walls of said tooth and of said support, wherein said pin comprises a crescent-shaped cross section contacting said front wall of said channel without contacting said rear wall of said channel so as to maintain said tooth in position, and wherein said side waves of said pin are transversely disposed between and resiliently contacting said first and second laterally disposed opposing side walls of said first and second apertures and of said channel so as to maintain said pin within said channel and so as to avoid sideward sliding of said hollow tooth on said nose of said support upon operation of said tooth.

4,455,772

MEMORIAL DISPLAY CASE

Claudette R. Miller, 7337 S. Shore, #525, Chicago, Ill. 60649

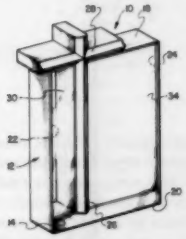
Filed May 13, 1982, Ser. No. 377,951
Int. Cl.³ G09F 19/00
U.S. Cl. 40—124.5 **3 Claims**

1. A memorial display case comprising:

a housing having a front side, a back side, a top surface and a bottom surface;

a first compartment formed within said housing, said first compartment having a first access opening located at said front side, said first access opening being normally closed by a first transparent window, said first transparent window being removably connected to said housing permitting access into said first compartment;

a second compartment formed within said housing, said second compartment having a second access opening



located at said front side, said second compartment being substantially greater in cross-sectional size than said first compartment, said second compartment being normally closed by a second transparent window, said second transparent window being removably connected to said housing to permit access into said second compartment; and

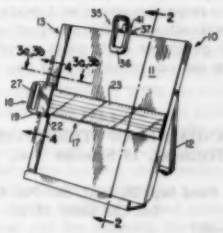
a cruciform attached to said housing, said cruicform comprising an upright elongated member to which is transversely attached a transverse elongated member, said upright elongated member being located between said first compartment and said second compartment.

4,455,773

NON-MAGNETIC LINE GUIDE UNIT FOR COPY HOLDER

John F. Denison, Lindenhurst, Ill., assignor to Wilson Jones Company, Chicago, Ill.

Filed Jan. 13, 1983, Ser. No. 457,724
Int. Cl.³ B41J 11/64
U.S. Cl. 40—352 **4 Claims**



1. A copy holder for holding sheet material including a face plate having a line guide unit which may be selectively positioned at various positions on the face plate comprising:

an elongated hook slide element attached to one side of the face plate, said hook slide element having a hook element;

a line guide unit positioned for sliding movement on the slide element, said line guide unit in turn comprising

a curved crooked element complementarily engaged with the hook element of the slide element;

a housing including a recess; and

a recess closure plate for closing the recess; and

a line guide arm mounted in said housing recess and held

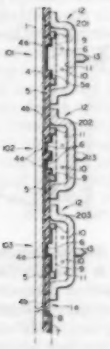
therein by said closure plate to position the arm extending across the face plate.

4,455,774

COMPOSITE FLUORESCENT DISPLAY APPARATUS

Hiroshi Watanabe, Mobara, Japan, assignor to Futaba Denshi Kogyo Kabushiki Kaisha, Mobara, Japan

Filed Jul. 14, 1981, Ser. No. 283,120
Claims priority, application Japan, Jul. 15, 1980, 55-95652
Int. Cl.³ H01J *63/02*
U.S. Cl. 40—451 **4 Claims**



1. A composite fluorescent display apparatus comprising:
a transparent substrate made of an insulating material;
a plurality of anodes made of a transparent conductive film, each anode coated with a phosphor layer on an upper surface thereof and disposed on said substrate in the shape of a display pattern;
said anodes being divided into at least two groups each having different display patterns for effecting different types of display;
filamentous cathodes stretched above each of said anodes for emitting thermions when energized and heated;
said thermions emitted from said cathodes being adapted to impinge upon said anodes so as to make said phosphor layer emit light; and
at least two back covers each of said at least two back covers air tightly bonded to said substrate so as to separately enclose a respective one of said anode groups and at least one of said cathodes within a respective one of at least two vacuum envelopes each made up of a portion of said substrate and one of said at least two back covers.

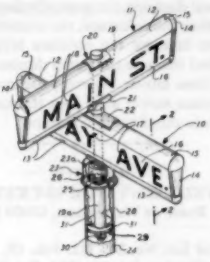
4,455,775

VANDALPROOF STREET NAME SIGN

George H. Fritzinger, 15 Standish Ave., West Orange, N.J. 07052

Filed Sep. 28, 1982, Ser. No. 424,863
Int. Cl.³ G09F *15/00*
U.S. Cl. 40—607 **8 Claims**

8. In a street name sign comprising a hollow-frame sign head, a top cap in interlocking engagement with said sign head, a post cap adapted for mounting on the upper end of a cylindrical sign post, and a center staff extending centrally through said sign head and said post cap with the upper end threaded into said top cap and the lower end portion extending beyond said post cap: the combination of means on said center staff securing said post cap and sign head into a unitary structure with clamping pressure against said top cap, and a lock collar secured firmly to the lower end of said center staff beyond said post cap, said collar having a clearance fit in said post as the sign is mounted thereon, and a pair of diametrically- opposite cantilever springs secured to the upper side of said collar adjacent to said center staff and having outer end portions extending beyond the periphery of said collar whereby when the sign is pressed down onto said post, said springs are bowed



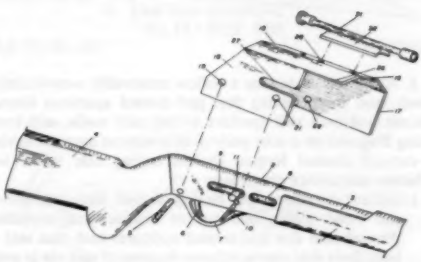
upwardly with a sliding one-way locking action against the inside wall of the post to permit easy mounting of the sign onto the post but to prevent a removal of the sign from the post.

4,455,776

SIGHT MOUNT DEVICE

R. B. Ashley, 8801 Cottingham Way, Louisville, Ky. 40258, and Glenn E. Kamer, R.R. #2, DePauw, Ind. 47115

Filed Sep. 22, 1981, Ser. No. 304,620
Int. Cl.³ F41G *1/38*
U.S. Cl. 42—1 ST **1 Claim**



1. A sight mount for a firearm having a receiver having an ejection port for expulsion of spent shells therefrom and a stock to carry a barrel where the mount includes a U shaped body having first and second leg means extending outwardly therefrom in generally spaced parrallel relation so that one leg is received on either side of the receiver and where the legs have at least one aligned aperture adjacent the lower edge thereof for attachment to the receiver and where the first leg of the mount has notch means to expose said ejection port of the receiver and a second notch to receive a pin carried by a bolt provided in the receiver.

4,455,777

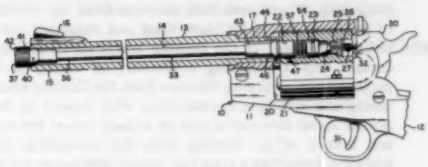
CALIBER-REDUCING KIT FOR A REVOLVER

David G. Callies, 3400 Goodfellow Ave., St. Louis, Mo. 63120

Filed Jul. 6, 1982, Ser. No. 395,485
Int. Cl.³ F41C *21/10, 1/00*
U.S. Cl. 42—59 **14 Claims**

1. A caliber-reducing adaptor kit for a revolver having an original revolver barrel, and a cylinder with a chamber having a powder-receiving compartment at one end, comprising:
(a) a substitute barrel having a reduced caliber bore received in and detachably mounted to the original revolver barrel, and

(b) a cylinder insert removably received in the cylinder chamber between the substitute barrel and the powder-



receiving compartment, the insert having a caliber bore substantially the caliber of the substitute barrel.

4,455,778

SYSTEM FOR HANDLING OF FISHING GEARS

Kolbjörn Björshol, N-6560 Langoyneset, Norway

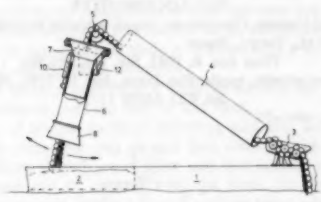
PCT No. PCT/NO81/00029, 371 Date Mar. 1, 1982, 102(e) Date Mar. 1, 1982, PCT Pub. No. WO82/00078, PCT Pub. Date Jan. 21, 1982

PCT Filed Jul. 6, 1981, Ser. No. 355,739

Claims priority, application Norway, Jul. 7, 1980, 802040

Int. Cl.³ A01K *73/06*

U.S. Cl. 43—8 **8 Claims**



1. A system for the guided positioning of a net-type fishing gear in a bin aboard a vessel, said system including a winch for hauling in the net-type fishing gear; a pull roller located at an elevated position with respect to the winch; an elongated guide means extending downwardly from a point below the pull roller toward the bin; and means connected to the elongated guide means to cause it to swing relative to the pull roller in mutually angularly displaced planes; the net-type fishing gear being hauled in by the winch and caused to pass over the pull roller, after which it slides down the elongated guide means substantially along the longitudinal axis thereof and is placed in the bin aboard the vessel.

4,455,779

FISHING ROD HOLDER APPARATUS

Ivan Cosic, 1685 No. Cass St., Milwaukee, Wis. 53202

Continuation of Ser. No. 207,906, Nov. 18, 1980, abandoned. This application Mar. 21, 1983, Ser. No. 476,918

Int. Cl.³ A01K *97/12*

U.S. Cl. 43—17 **10 Claims**

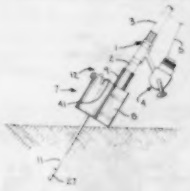
1. A fishing rod holder apparatus for supporting a fishing rod with the line and hook in the water, comprising:

a housing including an open top support chamber and an alert chamber secured to one side of said support chamber, an alert means located in said alert chamber and having a control element extended into said support chamber, a fish rod support socket member mounted in said support chamber and having a top opening adapted to receive the fishing rod,

a spring support means secured between the bottom end of said socket member and the bottom end of said support chamber to define a cantilevered pivotally support of said socket member to the support chamber and within the support chamber for pivotal movement within said support chamber,

alert operating means coupled to said socket member and connected to said alert control element and operable to activate said alert means,

mounting means for mounting said holder apparatus to a support means, and



said support chamber and alert chamber being formed in a single integral molded plastic body having an open top to both said chambers and a common separating wall defining said support chamber and said alert chamber, and said spring support means is a leaf spring member connected to a bottom wall of said socket member and to a bottom wall of said support chamber.

4,455,780

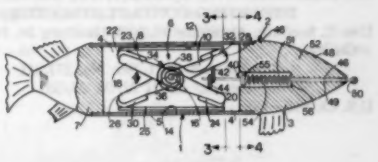
EXPANDABLE FISHING LURE

Denis L. Keable, #106-1623 Haro St., Vancouver, British Columbia, Canada V6G 1G8

Filed May 11, 1982, Ser. No. 377,087

Int. Cl.³ A01K *85/00*

U.S. Cl. 43—42.04 **8 Claims**



1. An expandable fishing lure comprising:

a flexible body with an interior cavity;

resiliently biased means within the cavity for expanding the body when released from a contracted position, the resiliently biased means being a pair of members for pressing against the flexible body on opposite sides of the cavity so the body expands transversely when the resiliently biased means is released from the contracted position, and the members being elongated and pivotally connected together at centers thereof in an X-shaped arrangement so each of the members has one end pressing against each said opposite side of the cavity; and

means for securing the resiliently biased means in the contracted position and for releasing the resiliently biased means when a fish strikes the lure so the lure expands.

4,455,781

SORTING TOP

Martin Blumenthal, 99 Longview Ave., Chatham, N.J. 07928

Filed Dec. 21, 1981, Ser. No. 332,464

Int. Cl.³ A63H *1/06*

U.S. Cl. 446—241 **9 Claims**

1. A toy with a spinable hollow body comprising

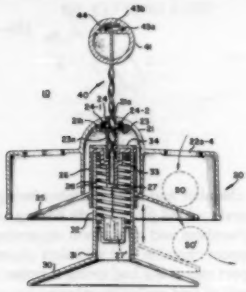
a base,

a plunger mounted on said base and depressable into said base,

a hollow body portion supported by said base for spinning movement relative thereto,

cooperating means on said plunger and body portion whereby the latter is spinable by the depression of said plunger into said base, and

a closure for said body portion mounted on said base and movable from a position closing said body portion to a position opening said body portion,



means for normally maintaining said closure in said closing position, said closure being openable by the depression of said plunger into said base,

wherein said base includes a collar into which said plunger is depressable and said closure is slidably movable along said collar.

4,455,782

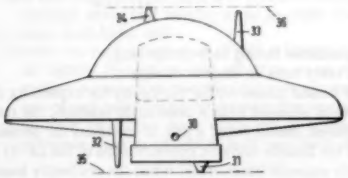
CARTESIAN TOY WITH ROTARY MOVEMENT IMPARTING CONTACT STRUCTURE

Uwe C. Seefluth, Alsterufer 37, 2000 Hamburg 36, Fed. Rep. of Germany

Filed Jun. 8, 1981, Ser. No. 271,211

Int. Cl.³ A63H *23/06, 23/08*

U.S. Cl. 446—155 **4 Claims**



1. A toy comprising:

(a) a partly transparent liquid container;

(b) means for varying the pressure of the liquid in the container; and

(c) a freely-floating body provided in the container and movable by buoyancy changes, the body including

(i) a casing with a closed cavity therein forming a liquid-filled zone and an air zone, wherein the air zone is compressible within the cavity by the increased liquid pressure in the container varied by the pressure varying means,

(ii) a single nozzle opening formed in the casing for providing the only inlet and outlet of liquid flow between the container and body cavity, the nozzle opening for producing a directed jet-like outflow of liquid from the body casing, forming a thrust directional axis for the body and imparting an accelerated horizontal movement of the floating body within the container only during rapid pressure changes in the body cavity as the air zone expands therein, and

(iii) container contact means fixedly connected to and projecting at predetermined locations from the outside of the body casing for controlling and imparting rotational movement of the floating body, said container contact means including a plurality of casing parts projecting to a varying distance from the floating body casing and arranged eccentrically with respect to the nozzle thrust directional axis on at least one of the top and bottom of the floating body for controlling the body and imparting a rotary or curved movement when contacting one of the liquid container and other objects within the container with one of the top and bottom of the floating body, said predetermined locations being arranged such that a rotary movement in one direction is imparted when slight contact is made between one of said casing parts located close to the nozzle thrust axis and at least one of the container and objects within the container, and said rotary movement in the other direction is imparted when a pronounced contact is made by two of said casing parts and at least one of the container and objects within the container while the floating body is sloped slightly in the opposite direction.

4,455,783

TOY LOCOMOTIVE

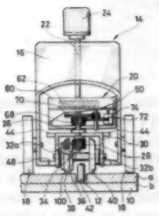
Toshiaki Nagano, Omocha-no, Japan, assignor to Shinsei Kogyo Co., Ltd., Tokyo, Japan

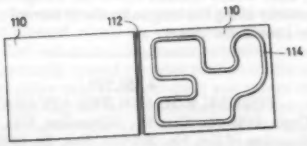
Filed Jun. 8, 1982, Ser. No. 386,391

Claims priority, application Japan, Jun. 15, 1981, 56-87658[U]

Int. Cl.³ A63H *11/10*

U.S. Cl. 446—71 **7 Claims**





1. A toy locomotive constructed to run along a track defined by a groove in a track surface, which comprises a locomotive body, at least two wheels laterally spaced apart mounted to the body to rotate freely, a clock work driving mechanism disposed in the body having a knurled knob for winding the driving mechanism, a small bogie suspended from the body, a drive wheel suspended from the bogie, a freely rotatable auxiliary wheel disposed opposite to and spaced from the drive wheel suspended from the bogie, the drive mechanism having an output shaft, a pinion mounted to said output shaft, a crown gear meshing with the pinion, the drive wheel being connected with the crown gear, and one or more guide pins connected to and extended downward from the bogie between the drive and auxiliary wheels beyond the bottom of the drive and auxiliary wheels in order to engage the groove in the track surface.

4,455,784

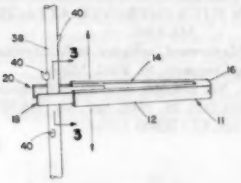
STEM CLEANER

Joseph S. Gallo, 58 Peach St., Walpole, Mass. 02081

Filed Apr. 23, 1982, Ser. No. 371,176

Int. Cl.³ A01G 3/01

U.S. Cl. 47—1 R 14 Claims



1. A stem cleaner for cleaning thorns and excess foliage and the like from stems, comprising:

two yieldable arms joined at one end by a handle connection portion and each having a free end extending generally along a longitudinal axis of each arm, said yieldable arms allowing the free ends of said arms to be biased toward one another when said arms are grasped by hand between said connection portion and said free ends, and

a cutting blade extending from at least one said free end,

said arms allowing said free ends to be pressed toward each other for bringing said blade in contact with a stem,

each said cutting blade comprising

a first surface providing a gauging surface for sliding movement over the bark of said stem,

a pair of second surfaces adjoining said first surface at each stem-wise end of said first surface, said second surfaces sloping away from said first surface so as to remain out of contact with the stem, the transition between said first and second surfaces being adapted to prevent bark from being stripped away from the stem and other damage to the stem,

at least one sharpened cutting edge extending generally parallel to said longitudinal axis for cutting away thorns, excess foliage and the like from the stem, said cutting edge being spaced outwardly from said first surface, to prevent said edge from contacting said stem and thus from stripping away bark therefrom and from otherwise damaging the stem.

4,455,785

SEAL FOR LIFTABLE AND LOWERABLE WINDOWS, ESPECIALLY SIDE WINDOWS FOR PASSENGER CARS OR STATION WAGONS

Johannes Wahr, Gechingen, and Guenter Kling, Böblingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,676

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1981, 3141729

Int. Cl.³ E06B 7/16

U.S. Cl. 49—488 6 Claims

1. A seal for a window means adapted to be raised and lowered, said seal comprising:

the seal being a hollow body,

said seal being secured at a frame means within a flanged area of an upper edge of the window means,

said seal being deformed during the raising of said window means,

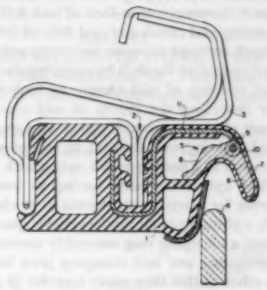
a sealing lip being outwardly disposed along the seal within the area of the window means,

the sealing lip being displaced in a direction toward the upper edge of the window means during the raising of said window means,

at least one bell crank means being pivotally carried within the seal,

the at least one bell crank means having a first leg and a second leg,

the first leg extending into said sealing lip,



the second leg being in juxtaposition with the window means, whereby

the window means, when being raised, acts upon the second leg of the bell crank, the second leg pivots the bell crank, and the bell crank presses the sealing lip against the upper edge of the window means.

4,455,786

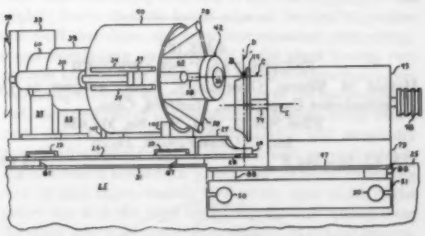
TWIST DRILL SHARPENING MACHINE

Lynn A. Maysilles, 15140 Hidden Valley La., Rochester, Mich. 48063

Continuation of Ser. No. 191,161, Sep. 26, 1980, abandoned. This application Aug. 9, 1982, Ser. No. 406,195

Int. Cl.³ B24B 7/00

U.S. Cl. 51—46 40 Claims



1. An improved twist drill sharpening machine for sharpening two lip straight shank twist drills, said machine being capable of sharpening different diameter drill bits over the commonly used range of drill sizes and drill lengths, said machine having a base and an in-feed table reciprocable on said base along an in-feed axis A, a chuck fast on said in-feed table and constructed to hold therein a drill bit to be sharpened, said drill bit having two clearance faces and two cutting edges thereon, a grinding wheel spindle and a grinding wheel reciprocable on said base along a grinding axis B perpendicular to said in-feed axis A, said grinding wheel having a concave grinding surface profile on its periphery in the form of a generated curve such that different portions of said profile correspond to the different drill sizes to be sharpened, said grinding wheel profile having grit and a matrix plated thereon so that it does not need wheel dressing during use thereof, means for holding said chuck on said in-feed table so that said drill bit is held at a workpiece axis C disposed between said axes A and B, the angle that workpiece axis C makes with grinding axis B

being equal to one-half of the included angle of the sharpened point to be placed on said drill bit, means using the present point of said drill bit for loading it in said chuck and orienting it radially in respect thereto so that said edges are maintained substantially parallel to axis B, means for incrementally moving said in-feed table along axis A so that said drill bit reaches axis B, means for flip-flopping said chuck and said drill bit held therin at each increment of in-feed of said drill bit, said means for flip-flopping said chuck and said drill bit held therein rotating said chuck through alternate reversing arcs of 180 degrees, incremental in-feed of the drill bit occuring during every other 180 degree rotation of said chuck, an hydraulic cushioning device for absorbing the inertia of said chuck as it travels through said alternate reversing arcs, said cushioning device constructed to bring said drill bit to rest at a predetermined point in respect to grinding axis B, said chuck having an elongated hollow cylindrical body having an unobstructed axial cavity therein for receiving workparts to be clamped of indefinite length, a plurality of circumferentially spaced apart clamping jaws and a clamping ring moveably carried on said body, said clamping ring and said clamping jaws being interlocked with each other so that they move together in unison and fluid powered means for actuating said clamping ring to move said clamping jaws into clamping position about said drill bit to be clamped, said fluid powered means disposed outside of said body, said clamping ring disposed outside of said body, said clamping jaws operative through the outside wall of said body and moveable radially thereof so that they close substantially at the axis of said body, means for sensing the clamping and unclamping movement of said chuck and means responsive to said sensing for raising and lowering said grinding wheel in respect to said base substantially along axis D, means for cycling said grinding wheel back and forth along axis B in respect to said drill bit for carrying out a grinding operation thereon, said means for cyclically reciprocating said grinding wheel constructed and arranged so that during the sharpening process said grinding wheel makes at least two grinding passes across each clearance face of said drill bit, and means for retracting said grinding wheel to a static position remote from its cyclic path of travel to allow loading and unloading of said bit.

4,455,787

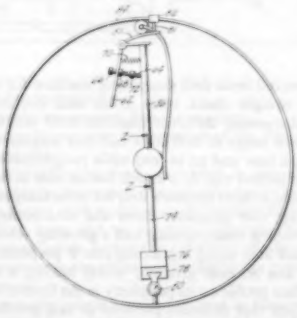
ENGINE FAN CASE GRINDER

Harold M. Sharon, Glastonbury, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Nov. 2, 1981, Ser. No. 317,634

Int. Cl.³ B24B *19/08, 19/26*

U.S. Cl. 51—241 S **12 Claims**



1. A grinder for the fan shroud of a gas turbine engine said engine including a shaft, the grinder mechanism including:

a support structure attached to the engine shaft and including a pair of eccentric sleeves one surrounding the other;

a hub mounted on said structure;

a bar on said hub; and

a grinder on the outer end of the bar, said eccentric sleeves being turnable one with respect to the other for adjusting the eccentricity of the hub relative to the shaft.

4,455,788

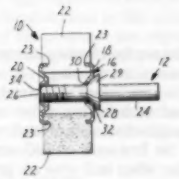
ABRASIVE WHEEL AND DRIVE SPINDLE COMBINATION WITH IMPROVED ATTACHING MEANS

Conrad T. Freerks, Maplewood, assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 274,668, Jun. 17, 1981, abandoned. This application Oct. 25, 1981, Ser. No. 545,581

Int. Cl.³ B24D *13/04*

U.S. Cl. 51—334 **4 Claims**



1. In combination, an abrasive wheel capable of high revolutions per minute including a hub having an axis, spaced inner and outer flanges, and abrasive material fastened between and projecting generally radially outwardly from between the flanges; and a one-piece spindle having an axis, a drive portion adapted to be releasably engaged in a drive motor for high speed rotation about its axis, a threaded end portion opposite said drive portion, a collar between said portions that increases in diameter from adjacent said threaded end portion toward said drive portion and a part free of threads joining said collar and said threaded end portion; the inner flange of said hub having an axially-centered opening adapted to pass the threaded end portion of said spindle and an axially-centered socket around said opening adapted to receive a portion of said collar, and said outer flange having an axially-centered opening and only one thread formed by said outer flange around said opening adapted to threadably receive the threaded end portion of said spindle so that engagement of said collar with said socket and engagement of said threaded end portion with said thread provide means for releasably and coaxially attaching said hub and spindle together to afford transferring rotational torque at high speeds from said spindle to said abrasive wheel.

4,455,789

SELF-CONTROLLED HONING MACHINE

Heinz Gehring, Ostfildern, Fed. Rep. of Germany, assignor to Maschinenfabrik Gehring GmbH & Co., KG, Ostfildern, Fed. Rep. of Germany

Filed Oct. 15, 1981, Ser. No. 311,792

Claims priority, application Fed. Rep. of Germany, Oct. 18, 1980, 30467

Int. Cl.³ B24B *5/10*

U.S. Cl. 51—34 J **32 Claims**

1. Honing machine for honing of bore holes (8) in a workpiece (9) having

a honing tool carrier (4);

at least one long honing blade (5,5*a*) having an axial extent corresponding at least approximately to a major portion of the depth of the bore hole, located on the carrier;

means (7,21,22) positioning the radial projection of the at least one long honing blade;

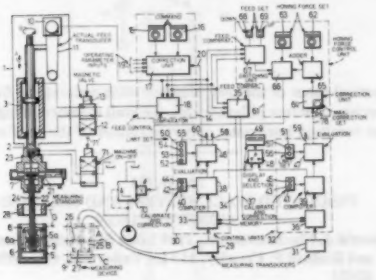
at least one short honing blade (6,6*a*) having an axial extent corresponding to the lowermost portion of the bore hole, located on the carrier;

short blade positioning means (7,23,24) positioning the radial projection of the at least one short honing blade;

means (3) for reciprocating the tool carrier (4) and hence the honing blades within the bore hole (8);

and comprising, in accordance with the invention,

measuring means (25) coupled to the bore (8) in the workpiece (9) and physically moving with the honing tool carrier (4) positioned in the region of the at least one short honing blade (6,6*a*) and including a measuring sensor (27); said said sensor (27) being located close to the end of the at least one short honing blade adjacent the bottom of the bore, and sensing the actual diametric dimension (WB, WC) of the bore hole in at least two planes (B,C) extending transversely to the axis of the hole, and providing,



sequentially, sensing signals representative of the actual dimension and and geometry of the bore at the respective planes;

and control means (32,61,70) including

memory means (36) storing the sequential sensing signals and

control signal generation means (39) for generating difference control signals as a function of the sensed dimensions as represented by said sequentially sensed signals at the respective planes (B,C),

said control means being coupled to the short blade positioning means (7,23,24) and controlling the pressure of application of the at least one short honing blade (6,6*a*) as a function of the difference between the sequential measurement signals derived from said sensors and representative of dimension and geometry of the bore.

4,455,790

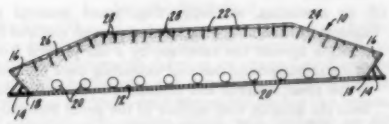
TARPAULIN ANCHORING SYSTEM

Pierre W. Curle, R.R. 3, Mattoon, Ill. 61938

Filed Mar. 12, 1982, Ser. No. 357,686

Int. Cl.³ E04D *1/34*; E04B *1/347*

U.S. Cl. 52—4 **5 Claims**



1. An anchoring system for securing a tarpaulin or like flexible cover in covering relation on a pile of grain or other granular material, comprising a plurality of anchors each embedded at a substantial depth in the grain pile, the anchors being spaced throughout the area covered by the tarpaulin, each anchor having an attachment element extending upwardly from the top of the pile, and a plurality of fasteners affixed to the underside of the tarpaulin, each fastener being connected to an attachment element of one of the anchors to secure the tarpaulin in place, each anchor being held in position in the pile by the weight of the granular material above the anchor.

4,455,791

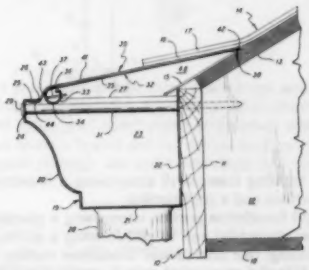
PROTECTIVE COVER FOR GUTTERS

George A. Elko, 19800 Woodpecker Rd., Petersburg, Va. 23803, and Charles B. O'Brien, 1308 Elmwood Dr., Colonial Heights, Va. 23834

Continuation-in-part of Ser. No. 272,209, Jun. 10, 1981, abandoned. This application Jun. 10, 1982, Ser. No. 386,988

Int. Cl.² E04D *13/04*

U.S. Cl. 52—12 **15 Claims**



1. A protective structure for installation over a gutter structure attached to a building having a sloping roof comprising sheathing and roofing material over the sheathing, the gutter structure comprising an elongated gutter having a generally U-shaped cross-section including upwardly extending inner and outer sides and being attached to the building adjacent to and slightly lower than the lower edge of the roof to receive water run-off therefrom, the protective structure comprising:

a cover comprising an elongated, solid sheet having two parallel longitudinal edges, one of the longitudinal edges extending under at least a lower edge of the roofing material, the other one of the longitudinal edges formed with a curl, the cover extending downwardly and outwardly from the lowermost edge of the roof, with the curl extending downward toward the gutter, and the cover extending over at least approximately 90% of the open width of the gutter but with the edge containing the curl spaced from the outer side of the gutter by a distance of at least approximately 0.3 cm; and

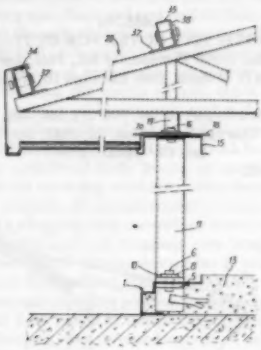
a plurality of spacer members disposable at a distance from one another along the outer edge of the sheet, each of the spacer members comprising engaging means for controlling the spacing between the outer edge of the sheet and the outer side of the gutter, the engaging means including a first part curved to fit at least partially around the curl at the other edge of the sheet and a second part shaped to engage the outer side of the gutter, the first part of the engaging means being spaced, in a direction toward the inner side of the gutter, from the second part by a distance determined at least partially by the desired distance between the outer edge of the sheet and the outer side of the gutter, whereby said spacer members will space said curl from the outer side of the gutter by said distance of at least approximately 0.3 cm, thereby permitting water to flow around said curl through said space and into said gutter, said cover preventing debris from entering said gutter and causing clogging thereof.

4,455,792

PROCESS FOR ERECTING A BUILDING AND BUILDING ERECTED IN ACCORDANCE THEREWITH

Roland Pasco, 46 avenue A. Briand, 50100 - Cherbourg, France

Filed Feb. 10, 1981, Ser. No. 233,094
Int. Cl.³ E04D *13/00*
U.S. Cl. 52—90 **7 Claims**



1. A building framework comprising a foundation portion, wall portions and a roof portion;

(a) said foundation portion comprising a plurality of U-sections assembled end to end forming a perimeter for said building; one arm of said U-sections resting horizontally so that the opening of said U-section faces the inside of said building, said other arm of said U-sections being provided with holes; reinforcing T-sections of which the top of said T-section forms a plate provided with vertical lugs having flanged upper portions; said T-section positioned beneath said other arm of said U-section at locations where said holes are positioned in the other arm of the U-section, said lugs of the T-section projecting through said holes in the other arm of the U-section;

(b) said wall portion comprising a plurality of uprights, said uprights having a horizontal base portion provided with holes adapted to fit around said vertical flanged lugs of the T-section, keys cooperating with said vertical flanged lugs for securing said uprights to said T-sections and said U-sections; said top portions of said uprights provided with horizontal plates having vertical flanged lugs welded to the top thereof, an upper belt joining the uprights together and being provided with holes through which said lugs of the horizontal plate project through said holes; and

(c) said roof portion comprising trusses with support plates having holes adapted to fit around said vertical lugs of said horizontal plates projecting through the upper belt and through support plates, keys cooperating with said lugs for being driven and locked by hammering said keys around said vertical lugs adjacent said flange.

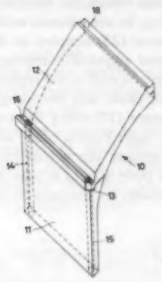
4,455,793

PREFABRICATED BUILDING BLOCK AND CIVIL BUILDING COMPOSED OF A PLURALITY OF SUCH BLOCKS ASSEMBLED TOGETHER

Franco Nania, Via delle Ninfe 37, Marsala, Trapani, Italy

Filed Jul. 15, 1981, Ser. No. 283,464
Claims priority, application Italy, Jul. 16, 1980, 23493 A/80
Int. Cl.³ E04B *7/02*
U.S. Cl. 52—91 **9 Claims**

1. A prefabricated building construction of a plurality of building units of molded synthetic material comprising a plurality of wall members being at least one story in height, each having at least two vertical, horizontally spaced-apart tubes embedded therein, at least two roof sections, each having an upwardly open horizontal trough portion at its lower end and an upwardly open space at its upper end, and a filling of concrete in the lower trough portion of the roof member and in the



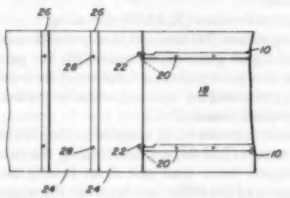
vertical tubes of the wall member with concrete to form reinforcing concrete pillars within the wall members integral with the resulting horizontal concrete runner of the roof member.

4,455,794

INSULATED WALL SYSTEM AND METHOD OF CONSTRUCTION

Donald J. MacKinnon, Jr., 1109 Main St., Cotuit, Mass. 02635, and Richard P. Crowley, 152 Ice Valley Rd., Osterville, Mass. 02655

Filed May 10, 1982, Ser. No. 376,294
Int. Cl.³ E04B *1/60*
U.S. Cl. 52—98 **15 Claims**



1. An insulated wall system which comprises in combination:

(a) a solid, generally vertical, wall substrate;

(b) at least one first metal-strapping-band material secured to and extending generally horizontally across the substrate, the strapping-band-material having or adapted to provide tab portions therefrom;

(c) means to secure the first strapping-band material to the substrate;

(d) an insulating, self-supporting, panel material placed against the first strapping band, the panel material held in position against the substrate by a tab portion from the first strapping-band material extending over the one edge of the panel material and extending over a short distance onto the interior wall surface of the panel material;

(e) generally vertical, second strapping-band material placed against and extending over the tab portion on the interior wall surface of the panel material and extending generally outwardly and over the outer edge of the panel material retained in position by the tab, so as to form a generally vertical recess for the insertion of the edge of the next panel material therein;

(f) means to secure the generally vertical, second strapping-band material to that portion of the tab material on the interior wall surface of the panel; and

(g) interior wall-panel material secured to the generally

vertical second strapping-band material and means to so secure the wall-panel material thereto,

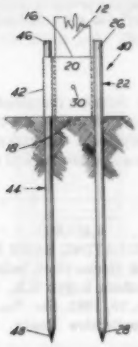
whereby an insulated wall system is formed, wherein a substrate is covered by insulation and by an interior wall surface.

4,455,795

POST ANCHORING DEVICE

Robert F. Cole, 2315 Diamond St., Stanton, Del. 19804

Filed Feb. 11, 1981, Ser. No. 233,378
Int. Cl.³ E02D 5/74, 27/42
U.S. Cl. 52—155 **4 Claims**



1. A post anchoring device comprising a main body section having a post receiving opening at the upper end thereof, an open lower ground engaging end, and side wall portions that completely surround a post when inserted into the upper opening thereof, a single fixed anchoring stake permanently secured to the outer surface of one of the side wall portions of the main body section having a top end adjacent the post receiving opening of the main body section and a ground penetrating lower end downwardly spaced from the open lower ground engaging end of the main body section, an open ended tubular socket permanently secured to the outer surface of the side wall portions of the main body section opposite the fixed anchoring stake, and a separate anchoring stake slidably receivable within the tubular socket.

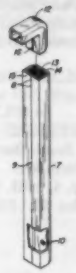
4,455,796

INSULATING GLASS UNIT AND SPACER BAR THEREFOR

Richard J. Schoofs, Moraga, Calif., assignor to Schoofs Incorporated, Moraga, Calif.

Continuation of Ser. No. 194,752, Oct. 7, 1980. This application May 6, 1983, Ser. No. 492,208
Int. Cl.³ E06B 7/12
U.S. Cl. 52—172 **5 Claims**

1. In a double glazed window comprising two panes of glass in congruent relationship defining an internal air filled space and generally hortizontal and generally vertical spacer bars enclosing said air space, each spacer bar having two opposing planar surfaces, one surface facing said enclosed air filled space, and the other surface facing the ambient atmosphere, the improvement which comprises employing as at least one of the generally vertical spacer bars a spacer bar filled with an adsorbent capable of adsorbing water vapor at or below a selected ambient temperature and of giving off the adsorbed water at ambient temperatures above the selected temperature, said at least one spacer bar being provided with opening(s) at one end of the planar surface facing the enclosed air filled space and having a small opening in the other planar surface facing toward the atmosphere, said small opening being so placed that the openings in the two planar surfaces are at opposite ends of the spacer bar whereby, during daily and seasonal variations in the temperature of the ambient atmosphere the pane exposed to the ambient atmosphere is alternately heated and cooled with resultant heating and cooling of the enclosed air filled space, water vapor is adsorbed when the



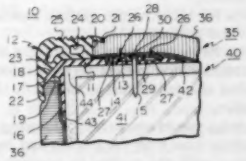
temperature in the enclosed air filled space drops and air from the ambient atmosphere flows through the solid adsorbent into the enclosed space, and water vapor is desorbed when air in the enclosed space is heated and the heated air flows from the enclosed space through the solid adsorbent into the atmosphere.

4,455,797

STAIR NOSING

Hiromitsu Naka, Saitama, Japan, assignor to Kabushiki Kaisha Naka Gijutsu Kenkyusho, Hokkaido, Japan

Filed Sep. 14, 1981, Ser. No. 304,259
Int. Cl.³ E04F 11/16
U.S. Cl. 52—179 **4 Claims**



1. A stain nosing for covering the tread nosing of a stair step, said stair nosing comprising:

an edge base formed of a hard synthetic resin material and adapted to fit on a tread portion of a stair step and to extend longitudinally along a tread nosing thereof;

a riser cover formed of said hard synthetic resin material integrally with said edge base and extending downwardly from a forward edge thereof to be positioned over a riser portion of the stair step;

a front flange formed of said hard synthetic resin material integrally with said edge base and said riser cover, said front flange extending forwardly from an upper front portion of said riser cover and from said forward edge of said edge base, said front flange having an upper surface inclined downwardly away from the riser portion, and said front flange having formed in an undersurface thereof catching groove means for receiving an upper edge of a piece of carpet adapted to cover the riser portion;

an edge bead cushion formed of a soft synthetic resin material or a semi-hard synthetic resin material integrally over a front portion of an upper surface of said edge base and over said inclined surface of said front flange;

a positioning groove formed in said upper surface of said edge base at a location rearwardly of said edge bead cush-

ion, said positioning groove extending in the longitudinal direction of the tread nosing of the stair step; and

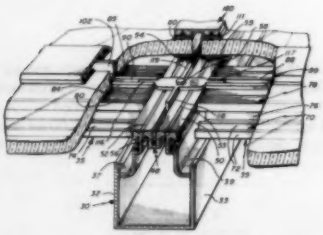
gripper means for securing said edge base to a piece of carpet adapted to cover the tread portion of the stair step, said gripper means comprising a gripper member adapted to fit into said positioning groove and thereby be secured to said edge base, and plural spaced nail-shaped members extending upwardly from said gripper member and adapted to be inserted into a tread portion covering piece of carpet.

4,455,798

SKYLIGHT SYSTEM

Nicholas G. Tsakiris, South Berwick, Me., assignor to Wasco Products, Inc., Sanford, Me.

Filed Sep. 4, 1981, Ser. No. 299,315
Int. Cl.³ E04B *7/18*
U.S. Cl. 52—200 **24 Claims**



1. A skylight system comprising;

a rigid structural framework having a plurality of rafters, a plurality of purlins, means supporting the rafters in a generally parallel spacing with individual purlins extending between adjacently spaced rafters, and means retaining the purlins in fixed position relative to the rafters,

glazing panels,

and means for securing the glazing panels intermediate the rafters and purlins,

said rafters having opposite side upright walls forming elongate condensation gutters on both sides of a rafter,

said purlins adapted to rest at an end on the upright wall of the rafter,

said retaining means comprising a locating means disposed at the intersection with the purlins and including means for engaging with the purlins to position and interlock the purlins in the proper position relative to the rafters and means separable from the rafter for securing the locating means to the rafter.

4,455,799

SKYLIGHT CONSTRUCTION

Arthur P. Jentoft, Kennebunkport, and Paul A. Couture, Emery Mills, both of Me., assignors to Wasco Products, Inc., Sanford, Me.

Continuation of Ser. No. 148,974, May 12, 1980, which is a continuation of Ser. No. 923,245, Jul. 10, 1978. This application Nov. 4, 1982, Ser. No. 439,027
Int. Cl.³ E04B *7/18*
U.S. Cl. 52—200 **26 Claims**

1. A skylight construction of an opening in a building comprising;

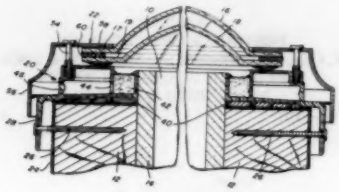
a curb frame extending about the opening and having means for receiving a means for securing the frame in place about the opening,

translucent or transparent means covering the opening and extending at its edges to the curb frame,

means for retaining the covering means on the curb frame,

said curb frame being constructed of a rigid thermoplastic material having co-extruded and integral therewith at least one gasket of flexible thermoplastic material for providing a leak-proof seal between the curb frame and covering means,

said rigid thermoplastic material forming the curb frame and



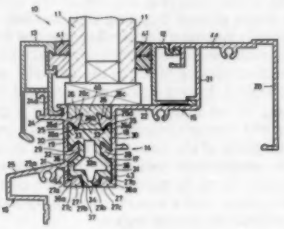
said co-extruded flexible thermoplastic material being commonly heat welded to join the curb frame mitres and also simultaneously weld the gaskets at the curb frame mitres to provide a continuous seal about the entire curb frame.

4,455,800

THERMALLY INSULATING SASH FRAME MEMBER

Shuuichi Hosooka, and Haruo Hori, both of Namerikawa, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Sep. 16, 1981, Ser. No. 302,704
Claims priority, application Japan, Sep. 25, 1980, 55-135336[U]
Int. Cl.³ E04C *1/00*
U.S. Cl. 52—309.1 **6 Claims**



1. A thermally insulating sash frame member, comprising:

a pair of spaced opposed elongate metal walls having respective facing surfaces, each of said walls having a respective lower flange extending lengthwise therealong and extending toward the other of said walls, each of said walls having a respective upper flange extending lengthwise therealong and extending toward the other of said walls, and each of said walls having an intermediate flange extending lengthwise therealong between said upper and lower flanges, said upper flanges each having a lower surface sloped downwardly in a direction toward the other of said walls, and said lower flanges each having an end surface facing the other of said walls and sloped downwardly in a direction toward the other of said walls;

a thermally insulative rigid connector bar disposed between and connected said pair of walls, said connector bar extending only up to said upper flanges and having a pair of upper sloped surfaces each confronting and generally parallel to a respective one of said lower sloped surfaces of said upper flanges, and said connector bar having a pair of lower sloped surfaces each confronting and generally parallel to a respective one of said sloped end surfaces of said lower flanges;

a respective resilient thermally insulative pad disposed be-

tween each of the confronting and generally parallel flange and connector surfaces;

said upper and lower flanges being in a stressed condition for pressing toward the confronting and generally parallel connector bar surfaces to maintain said pads in a compressed condition, and

a layer of thermally insulative material between said walls covering said connector bar and said upper flanges and filing the space between said walls above said connector bar.

4,455,801

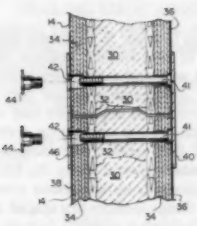
LIGHT WEIGHT VAULT WALL

W. R. Merritt, Nepean, Canada, assignor to Canadian Patents & Development Limited, Ottawa, Canada

Filed Jul. 29, 1982, Ser. No. 403,001

Int. Cl.³ E04B *2/02*; E04H *3/08*

U.S. Cl. 52—309.9 **6 Claims**



1. A strong wall for delaying unauthorized access to the interior of a vault or other structure constructed of said strong walls, said strong walls comprising:

a foamed polymeric resin core capable of bonding with power tools and producing noxious fumes when burned, said core having inner and outer major faces,

expanded metal mesh embedded in at least an outer face of said core,

inner and outer wood panels covering both faces of said core,

a heat conductive metal sheet covering the inner wood panel, and

a metal sheet covering said outer wood panel.

4,455,802

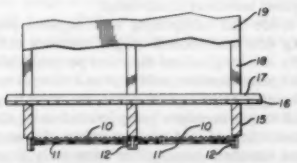
WIRE SCREEN FIRE STOPS

Joseph Charniga, P.O. Box 292, New Middletown, Ohio 44442

Filed Jun. 17, 1982, Ser. No. 389,223

Int. Cl.³ E04B *1/94*

U.S. Cl. 52—317 **2 Claims**



1. In a building structure of the wooden frame type having vertically and horizontally positioned frame members, the improvement comprising means for stopping the upward propagation of fire, said means consisting of horizontally disposed rectangular fire stops formed of perforated metal sheets and metal screen mesh, said metal screen mesh being positioned on and supported by said perforated metal sheets, flanges formed on oppositely disposed edge portions of said metal sheets, means attaching said flanges to said frame members so as to position said fire stops in said building structure in vertically spaced relation to the surfaces of said horizontally disposed wooden members thereof.

4,455,803

APPARATUS FOR SEALING FLAT ELEMENTS TOGETHER, PARTICULARLY ROOF ELEMENTS

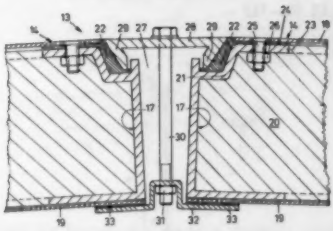
Otto Kornberger, Hettstadt, Fed. Rep. of Germany, assignor to MERO-Raumstruktur GmbH & Co. Wurzburg, Fed. Rep. of Germany

Filed Aug. 16, 1982, Ser. No. 408,183

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 8123976[U]

Int. Cl.³ E04B *7/00*

U.S. Cl. 52—395 **3 Claims**



1. Apparatus for the sealing of flat elements, particularly roof elements, which are supported at their corners, e.g., by a space framework, characterized in that a bowl-shaped part (**21**) is provided on the outside edge of the roof elements (**14**) in the area of the top edges thereof, and runs substantially parallel to said edges; a sealing tape (**22**) is placed in said bowl-shaped part; and that for engagement of any two adjacent roof elements (**14**) in the bowl-shaped part (**21**), a cover rail (**28**) with arms (**29**) extending downwardly at an angle is provided, said arms being adapted to compress sealing tape (**22**) by means of securing means (**30**), which are inserted between cover rail (**28**) and the adjacent roof elements (**14**) beneath the rail, said bowl-shaped parts (**21**) being provided in profile strips (**17**) which define the outside periphery of roof elements (**14**) connected to a frame, and that a strip flange (**23**) extends in substantially parallel relation to the plane of roof element (**14**) from the inside top longitudinal edge of the bowl-shaped part (**21**) of a profile strip (**17**), and that a part (**24**) of the sealing tape (**22**) from the bowl-shaped part (**21**) of profiled strip (**17**) extends outwardly over strip flange (**23**) and is clamped and sealed between a cover sheet (**18**) of roof element (**14**) and strip flange (**23**).

4,455,804

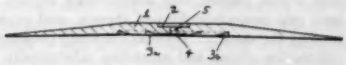
MEMBRANE ANCHOR

Thomas F. Francovitch, Columbia, Md., assignor to Single-Ply Institute of America, Inc., Columbia, Md.

Filed Feb. 19, 1982, Ser. No. 350,180

Int. Cl.³ E04B *1/38*

U.S. Cl. 52—698 **19 Claims**



1. A membrane anchor comprising a resilient, water-impervious disc of rubber-like material having upper and lower surfaces, an axial opening at the center of said disc, said disc

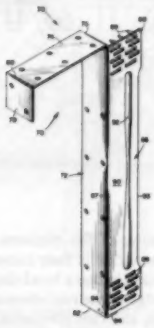
having a central region of substantially uniform thickness and a peripheral region of tapering thickness adjacent to and outwardly of said central region, said peripheral region being of substantially the same thickness as said central region at the juncture of said regions, said lower surface of said disc at said central region being substantially planar and having continuous groove means therein about said opening for receiving sealing material.

4,455,805

TRUSS ASSEMBLY AND TRUSS HANGER FOR USE WITH TRUSSES

Carlos S. Rionda, and Joaquim J. Palacio, both of Miami, Fla., assignors to Gang-Nail Systems, Inc., Miami, Fla.

Filed Sep. 24, 1982, Ser. No. 423,169
Int. Cl.³ F16B 5/00
U.S. Cl. 52—712 **9 Claims**



1. A hanger for trusses comprising:

(a) a bracket having a first leg with first and second ends, the first leg having a side which is adapted to engage the width of a beam, a base, disposed in a first plane, having first and second ends, the first end of the base being attached to the first end of the leg at approximately a 90° angle, the base being adapted to engage the top of the beam and a second leg, disposed in a second plane which is parallel to the first plane, and is attached to the second end of the base at an approximate 90° angle, the second leg being adapted to engage a second side of the beam across is width;

(b) a support sheld attached to the second end of the first leg, said support shelf forming an approximate 90° angle with respect to the first leg and projecting away from the opposite side of the first leg which is adapted to engage the beam;

(c) an attachment member having upper and lower connecting plates disposed at opposite ends of an intermediate member, said attachment member being joined to the first leg to form a substantially 90° angle therewith and projecting away from the opposite side of the first leg which is adapted to engage the beam, and each of said connecting plates having a plurality of sharp projections extending generally perpendicular from the plate for use in fixedly attaching the connecting plate to wooden members within trusses, said intermediate section having at least one projection formed therein, said projection extending the same direction as the sharp projections of the connecting plates, and extending substantially the entire length of the intermediate section between the connecting plates; and,

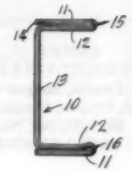
(d) a support shelf attached to the lower connecting plate at an approximate 90° angle therewith and projecting in the direction of the sharp projections of the lower connecting plate.

4,455,806

STRUCTURAL BUILDING MEMBER

Donald W. Rice, 2731 Sagamore Rd., Toledo, Ohio 43606

Continuation of Ser. No. 914,887, Jun. 12, 1978. This application Nov. 27, 1981, Ser. No. 325,134
Int. Cl.³ E04C 3/30
U.S. Cl. 52—732 **7 Claims**



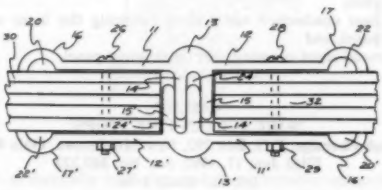
1. Amend to read as follows: A structural member formed from a unitary strip of substantially uniform thickness: said member having a flat web and a first flange: said first flange having a first section continuous with said web and with the first flange section forming an angle with said web: said first flange having a second section continuous with first section and overlapping said first section and including separately disposed spacing members spaced along the beam in contact with both flange sections in an unstressed condition of the beam to maintain said flange sections in a spaced apart relationship and wherein an insulating cavity is formed between said first and second sections of said first flange.

4,455,807

SPLICE RAIL ASSEMBLY

Donald J. Ehrlich, Monon, Ind., assignor to Evans Products Company, Portland, Oreg.

Filed May 28, 1982, Ser. No. 383,241
Int. Cl.³ E04B 1/60
U.S. Cl. 52—770 **5 Claims**



1. In a trailer body having side walls formed of a plurality of panel members, the improvement in mechanically joining adjacent panel members comprising:

a first splice rail comprising an elongated plate member having first and second tongue member extending outwardly in a longitudinal direction perpendicular the plane of said plate member, said first and second tongue members being parallel to each other, the inner face of the first of said tongue members being located along the longitudinal centerline of said plate member, the second of said tongue members being offset outwardly from the inner face of said first tongue member by a distance substantially equal to the thickness of said first tongue member,

a second splice rail identical to said first splice rail and positioned adjacent to said first splice rail with the longitudinal centerlines of said first and second splice rails being parallel and located in the same plane perpendicular to said splice rails, the first tongue member of each of said first and second splice rails being located between the first and second tongue members of the other of said splice rails,

the sides of ends of said adjacent panel members being located between said first and second splice rails outwardly of the second tongue member of each of said first and second splice rails, and

a plurality of fastening members securing said first and second splice rails to said adjacent panel members.

4,455,808

SEALING SHOE ASSEMBLY

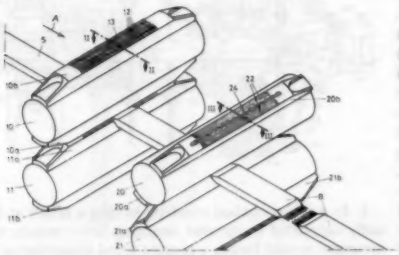
Peter Netzhammer, Klettgau, Fed. Rep. of Germany, assignor to SIG - Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Dec. 23, 1981, Ser. No. 333,690

Claims priority, application Switzerland, Dec. 24, 1980, 9597/80

Int. Cl.³ B65B *51/16, 51/30*

U.S. Cl. 53—373 12 Claims



1. In a sealing shoe assembly for providing superposed sheets with a sealing seam formed by a criss-cross pattern of straight lines by pressing together areas of the superposed sheets moving through the sealing shoe assembly relative thereto in a direction of advance, the improvement comprising:

(a) a first pair of cooperating first sealing shoes each having a work face including a plurality of parallel-extending first stamping edges oriented in a first direction and arranged to periodically assume a meshing relationship for periodically pressing together and stamping consecutive predetermined areas of the superposed sheets passing between the work faces of the first sealing shoes, whereby a first pattern of parallel straight lines is provided on said predetermined areas; and

(b) a second pair of cooperating second sealing shoes each having a work face including a plurality of parallel-extending second stamping edges oriented in a second direction; the work faces of said second sealing shoes being in their entirety in alignment with the workfaces of said first sealing shoes as viewed in said direction of advance and said second stamping edges being arranged to periodically assume a meshing relationship for periodically pressing together and stamping, in their entirety, said predetermined areas previously stamped by said first sealing shoes, whereby a second pattern of parallel straight lines is provided on said predetermined areas; the parallel straight lines of said second pattern traversing the parallel straight lines of said first pattern, whereby said criss-cross pattern over the entire predetermined areas is obtained.

4,455,809

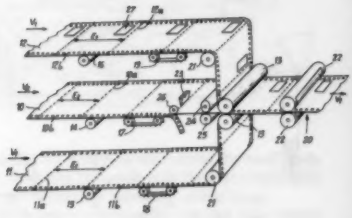
PROCESS AND APPARATUS FOR MANUFACTURING CONTINUOUS SEALED POSTAL OR OTHER ENVELOPE ASSEMBLIES

Arthur B. Dallaserra, Aulnay sur Bois, France, assignor to Iseto Shiko Co., Ltd., Osaka, Japan

Filed Nov. 7, 1980, Ser. No. 204,815

Int. Cl.³ A21C *15/04*

U.S. Cl. 53—435 18 Claims



1. A process for forming a continuous assembly of sealed envelopes having upper and lower sections and comprising at least one insert of the type used as a postal mailer or the like comprising the steps of:

(a) providing continuous upper and lower sheets each comprising transverse weakening lines defining said upper and lower sections adapted to be separated along each of said lines, consecutive weakening lines being separated by a substantially constant spacing E1;

(b) providing a continuous intermediate sheet comprising transverse weakening lines defining intermediate discrete sheet sections having a width less than the width of said upper and lower sections, consecutive weakening lines being spaced by a substantially constant spacing E2, E2 being less than E1;

(c) passing said upper and lower continuous sheets along discrete paths and through driver rollers at the inlet of a sealing station at a velocity V1 equal to the tangential speed of said drive rollers and passing said continuous intermediate sheet along a path and toward said driver rollers at a velocity V2 less than V1 wherein V2/V1 substantially equals E2/E1;

(d) progressively separating said continuous intermediate sheet to form discrete intermediate sheet sections along each of the weakening lines of said continuous intermediate sheet during passage through a separation station positioned ahead of said drive rollers whereby each of said intermediate sheet sections is positioned between said upper and lower continuous sheets to form said continuous assembly as it enters said drive rollers;

(e) passing said continuous assembly through said sealing station at an average velocity V1 to seal said upper and lower continuous sheets to form said sealed assembly; and

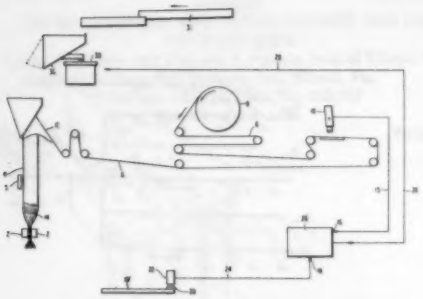
(f) said step of progressively separating said continuous intermediate sheet comprising first subjecting each of said intermediate sheets to a forceful acceleration at a distance E2 ahead of said driver rollers thereby increasing its velocity to a velocity V3, V3 being substantially greater than V2 so as to achieve a clean separation of successive intermediate sheet sections by ripping them off along the weakening lines on said intermediate continuous sheet and subsequently substantially reducing the velocity of said intermediate sheet section to said average velocity V1 prior to entering said drive rollers.

4,455,810

METHOD AND APPARATUS FOR DETECTING POSSIBLY DEFECTIVELY-SEALED BAGS

William D. Kreager, Dallas, Tex.; Stanley I. Mason, Jr., Weston, Conn., and Larry W. Wilson, Dallas, Tex., assignors to Frito-Lay, Inc., Dallas, Tex.

Filed Nov. 4, 1981, Ser. No. 318,054
Int. Cl.³ B65B 57/06
U.S. Cl. 53—451 13 Claims



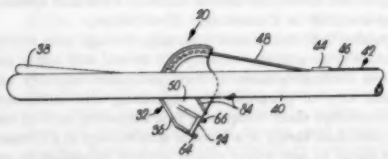
1. In a method for forming and filling bags of predetermined length from continuous, flexible, bag-forming sheet material, having a line of adhesive along its length, wherein the sheet material is formed into a tube, the tube is sealed at a position corresponding to the end of a bag, the closed-end tube is sealed along its length and filled with product, the filled portion of the tube is sealed and severed from the continuous sheet material at a position corresponding to the other end of the filled bag and said forming and filling are replicated, the steps for detecting and preventing the filling of possibly defectively-sealed bags, comprising passing the continuous sheet material to a tube-former for forming the sheet material into the tube, sensing said line of adhesive to detect defects therein and developing a signal indicative of such defect, said sensing being conducted upstream of said tube-former, and using said signal to prevent the filling of the tube when the portion of the sheet material bearing detected defective adhesive is in the bag-filling position.

4,455,811

BAIL ATTACHMENT LAWNMOWER ZONE START CONTROL

Anthony F. Beugelsdyk, Wichita, Kans., assignor to Conchemco, Incorporated, Lenexa, Kans.

Filed Jan. 20, 1983, Ser. No. 459,409
Int. Cl.³ A01D 75/20
U.S. Cl. 56—10.8 5 Claims



1. An attachment for a lawnmower handle having a movable lever with a pair of opposed ends and a shiftable cable including a cable end portion comprising:

a body having an aperture therethrough for receiving one of the ends of said movable lever;

a channel formed in said body and in communication with said aperture for receiving a stretch of said movable lever adjacent said one end of the lever;

means mounting said body on the lawnmower handle,

said means including said one end of the movable lever outwardly beyond its extension through said aperture, said one end being pivotally received in an opening formed in said handle, the opening being in alignment with said aperture, whereby said body may be pivoted with respect to said handle when the lever is moved; and

structure defining a slot within said body,

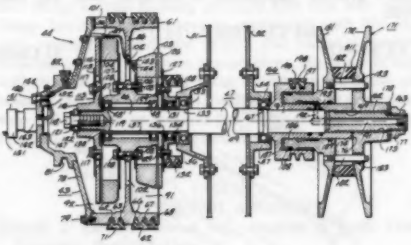
said slot receiving said cable end portion, whereby said cable is shifted when said body is pivoted with respect to said handle by movement of said lever.

4,455,812

COMBINE DRIVE WITH DOUBLE CLUTCH ASSEMBLY

Larry R. James, Olathe, Kans., assignor to Allis-Chalmers Corp., Milwaukee, Wis.

Filed Jan. 24, 1983, Ser. No. 460,487
Int. Cl.³ A01D 41/12; A01F 12/56
U.S. Cl. 56—11.5 19 Claims



1. In a self-propelled combine having a frame at least partially supported by ground engaging drive means, an engine mounted on said frame, a change speed transmission having a rotary input shaft and a rotary output shaft connected in driving relation to said ground engaging drive means, a cleaning mechanism driven by a rotary input element, a grain bin and a bin unloading mechanism driven by a rotary input member, the combination comprising:

a header mechanism driven by a rotary input component,

a threshing mechanism having a rotor,

a pair of laterally spaced upright side walls on said frame at laterally opposite sides of said combine,

a horizontal, transverse power transmitting shaft exending between said walls with opposite end portions extending beyond the laterally outer sides of said walls,

a pair of bearing means rotatably mounting laterally spaced portions of said shaft on said walls, respectively,

a variable pitch V-belt sheave nonrotatably mounted on one of said end portions of said shaft at the laterally outer side of one of said walls,

power transmitting means between said variable pitch V-belt sheave and said rotor including a V-belt in driven engagement with said variable pitch V-belt sheave,

a double clutch assembly operatively associated with the other end portion of said shaft at the laterally outer side of the other of said side walls including

an annular housing concentric with said shaft having

a hub portion rotatably mounted on said other end portion of said shaft,

a cylindrical rim portion presenting at least one V-belt groove, and

a disk portion rigidly connected at its radially inner part to said hub and at its radially outer part to an axially intermediate and radially inner defining a laterally inner pocket and a laterally outer pocket,

a first power operated clutch in said laterally outer pocket

selectively operable to drivingly connect said annular housing to and to disconnect said annular housing from said shaft,

a header belt sheave rotatably mounted on said combine in coaxial relation to said shaft and laterally between said other side wall and said annular housing, and

a second power operated clutch in said laterally inner pocket selectively operable to drivingly connect said annular housing to and to disconnect said annular housing from said belt sheave,

power transmitting means connecting said engine to said annular housing including a V-belt in power transmitting engagement with said V-belt groove, and

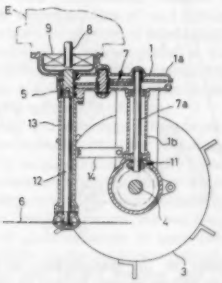
power transmitting means interconnecting said header belt sheave to said header mechanism including a belt operatively engaging said belt sheave.

4,455,813

WALK-BEHIND TYPE WORK VEHICLE

Takashi Hira, Sakai, Japan, assignor to Kubota, Ltd., Osaka, Japan

Filed Apr. 7, 1982, Ser. No. 366,271
Claims priority, application Japan, Apr. 8, 1981, 56-51012[U]
Int. Cl.³ A01D *35/26*
U.S. Cl. 56—11.8 **6 Claims**



1. A walk-behind type work vehicle comprising an engine, a transmission casing below said engine, an output shaft extending from said engine downwardly toward said transmission casing, a main clutch operatively connected to said output shaft, and to a power take-off shaft which extends downwardly to said transmission casing, an axle journaled on one end of said transmission casing, two running wheels mounted on said axle and rotatable thereby, and a steering handle secured to said vehicle, in which:

said transmission casing comprising a first case portion extending substantially horizontally relative to said engine and a second casing portion extending substantially vertically from a rear part of the first casing portion, thereby constituting substantially an inverted L-shape in side view,

said first casing portion carries at a forward part thereof said engine and said power-takeoff shaft extending downwardly to drive a working implement, the power-takeoff shaft being operatively connected to the output shaft via said clutch,

said second casing portion housing a transmission shaft operatively connected to the output shaft through a reduction drive mechanism housed in said first casing portion and to said axle disposed relative to said second casing portion,

said second casing portion provides space between a bottom of the first case portion and tops of the running wheels and

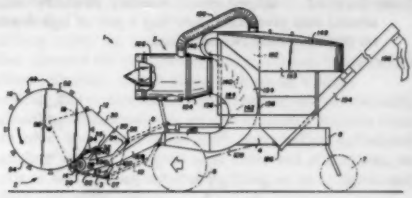
a rotary shaft in axial alignment with said power-takeoff shaft, and driven thereby.

4,455,814

SEED HARVESTER

John C. Kienholz, Edmonton, Canada, assignor to Her Majesty The Queen in right of Alberta as Represented by The Minister of Agriculture, Edmonton, Canada

Filed Jan. 18, 1982, Ser. No. 340,322
Int. Cl.³ A01D *45/30*; B01D *45/16*
U.S. Cl. 56—126 **4 Claims**



1. A header assembly for stripping seeds from the seed heads of a standing crop, whereby the seeds may then be drawn into a seed separating and collection assembly, comprising:

a frame assembly forming a forwardly opening inlet means for connection with the seed separating and collection assembly;

a drum assembly mounted in the frame assembly immediately forward of the inlet means, said drum assembly comprising longitudinally spaced apart, upstanding support members and a plurality of elongate members forming stripping edges and extending longitudinally between the support members and being attached circumferentially thereto, said drum assembly being arranged to be rotated so that its forward end is moving upwardly at a relatively high rate of speed about a substantially horizontal axis;

a cylindrical reel mounted in the frame assembly with its longitudinal axis above and parallel to the corresponding axis of the drum assembly, said reel being arranged to be rotated so that its forward end is moving downwardly at a relatively low rate of speed, said reel comprising spaced apart, upstanding support means and a plurality of elongate batts extending longitudinally between the support means and being attached circumferentially thereto, whereby said support means and batts form openings therebetween which extend inwardly toward the axis of the reel so that, when the reel is partly submerged in the crop and is rotated, a segment of crop is trapped between a pair of batts and is deflected by one of the batts into contact with the stripping edges of the drum assembly;

each said batt having a broad cushioned working surface arranged to substantially tangentially contact and compress, substantially across the width of said working surface, against the stripping edges of the drum assembly in the course of a rotation about the axis of the reel, to thereby positively hold substantially all the seed heads, which have been deflected, against said stripping edges to cause seeds to be stripped therefrom.

4,455,815

TREE TRIMMING APPARATUS

Spencer H. Grant, 1220 Millers Mill Rd., Stockbridge, Ga. 30281

Filed Feb. 12, 1982, Ser. No. 348,493
Int. Cl.³ A01D *55/18*
U.S. Cl. 56—235 **4 Claims**

1. A tree trimming apparatus adapted to be manually controlled by an operator comprising:

a pair of ground engaging wheels;

a common axle rotatably mounting both said wheels in spaced apart positions;

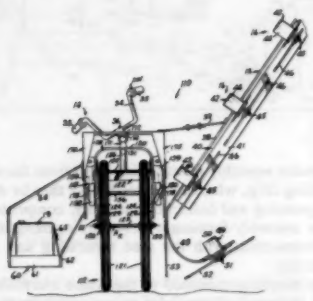
a support frame connected to said common axle;

handle means mounted on said support frame and adapted to

be grasped by the operator so the operator can keep said support frame at a prescribed pivotal position on said axle during operation;

a pivot axle mounted on said support frame above said wheels and oriented generally normal to said common axle so that said pivot axle is generally horizontal when the operator holds said support frame at said prescribed pivotal position;

an inverted U-shaped pivot member rotatably mounted around said pivot axle including a pair of legs depending on opposite sides of said wheel;



a cutter assembly mounted on one of said legs of said pivot member and extending upwardly and outwardly therefrom, said cutter assembly adapted to trim a tree along a cutting plane;

a power supply mounted on the other of said legs of said pivot member on the opposite side of said wheel from said cutter assembly, said cutter assembly and said power supply arranged so that the respective weights thereof cause said pivot member to be maintained in a prescribed pivotal position on said pivot axle with said cutting plane located at a prescribed angle with respect to the vertical without regard to the angle of said common axle with respect to the horizontal.

4,455,816

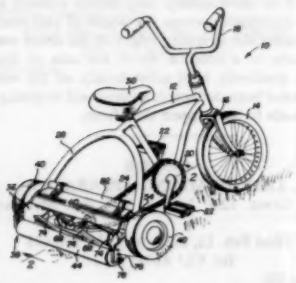
PEDAL OPERATED MOWER

Deanna F. Porath, P.O. Box 7464, Montgomery, Ala. 36107

Filed Jun. 29, 1982, Ser. No. 393,408

Int. Cl.³ A01D *53/02*

U.S. Cl. 56—249 **8 Claims**



1. A pedal operated mower assembly comprising a tricycle frame having a front wheel mounted in a fork, a central frame mounting a pedal sprocket and a wide fork frame at the rear supporting a reel-type mower assembly, the mower assembly having spaced support plates mounted on the wide fork frame, the support plates supporting a shaft having a rear sprocket about a midpoint of the shaft for chain engagement with the pedal sprocket, separate arrays of cutter blades spaced about the shaft on opposite sides of the rear sprocket respectively, said arrays of blades being mounted upon the shaft for rotation therewith and defining a gap therebetween in which is located the rear sprocket, a drive chain connecting the pedal sprocket and the rear sprocket, the drive chain being received in said gap, and a cutter member cooperating with the cutter blades for providing mowing of the grass.

4,455,817

APPARATUS FOR THE MANUFACTURE OF A FANCY YARN

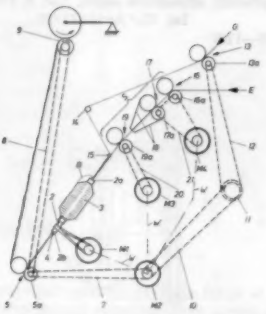
Atul Mehta, Börwang, Fed. Rep. of Germany, assignor to Saurer-Allma GmbH, Kempten, Fed. Rep. of Germany

Filed Jun. 2, 1982, Ser. No. 384,309

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125576

Int. Cl.³ D02G *3/34, 3/38;* D01H *7/88*

U.S. Cl. 57—18 **6 Claims**

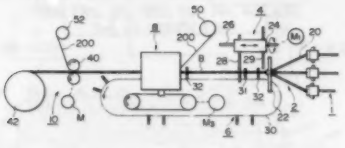


1. In an apparatus for the manufacture of a fancy yarn, comprising a rotary hollow spindle having an entry end and a discharge end, said hollow spindle having a binding thread spool thereon and a false twist element at said discharge and, thread feed means adjacent said entry end for feeding at least one core thread and at least one fancy thread to said hollow spindle, said thread feeding means including a first drive means for effecting a faster supply of said fancy thread than said core thread, and wherein said apparatus also comprises a pair of take-up rolls adjacent said discharge and and downstream of said false twist element, said take-up rolls drawing off a finished fancy yarn at a lower speed than the feed speed of said fancy thread to said entry end of said hollow spindle, the improvement comprising wherein said thread feeding means includes a drawing means operatively engaging said fancy yarn, said drawing means having a pair of entry rolls, a pair of middle rolls and a pair of exit rolls, and a separate pair of delivery rolls for said core thread, wherein a first individual controllable drive motor is provided for driving said hollow spindle and a second individual controllable drive motor is provided for driving said pair of exit rolls, and a common controllable drive motor is provided for said pairs of entry and middle rolls, wherein said core thread delivery rolls are coupled to a central motor by a belt drive, wherein said central motor is further coupled to said pair of take-up rolls by way of a belt drive, and wherein said central motor serves as a control motor and is connected to said other drive motors through means responsive to a change in the speed of rotation of said central motor and effecting a change in the speeds of rotation of said other drive motors in the same ratio as the change in the speed of rotation of said central motor.

4,455,818
APPARATUS FOR MANUFACTURING FLAT TWISTED CABLE

Yasuo Sugimoto; Masami Maeda; Hiroshi Ishimura; Satoshi Saito, and Koichi Chinone, all of Ibaraki, Japan, assignors to Hitachi Cable Ltd., Tokyo, Japan

Filed Apr. 8, 1982, Ser. No. 366,613
Claims priority, application Japan, Jul. 1, 1981, 56-102752
Int. Cl.³ H01B 13/04, 13/06
U.S. Cl. 57—293 10 Claims



1. An apparatus for continuously manufacturing a flat twisted cable composed of a plurality of single-conductor pairs each having alternate oppositely directed twisted portions with straight portions therebetween, comprising:

a plurality of twisting tubular dies arranged in a plurality of stages for receiving said single-conductor pairs and for twisting the single-conductor pairs alternately in opposite directions with non-twisted, straight portions therebetween, the outlet nozzles of said tubular dies being disposed in a horizontal plane at substantially equal intervals;

untwist preventing means disposed in the vicinity of the output nozzles of said dies for preventing the propagation of the twist of said twisted portions to the straight portions of the single-conductor pairs;

lateral spacing and converging means movable along with the single-conductor pairs for receiving the straight portions of the single-conductor pairs from said untwist preventing means and carrying them while permitting a lateral convergence of the single-conductor pairs;

reciprocable welding means for welding the coatings of adjacent single-conductors to each other in the straight portions of the single-conductor pairs thus-converged and carried by said lateral spacing and converging means while moving along with the straight portions, to thereby manufacture a flat twisted cable; and

take-up means for taking up the flat twisted under tension.

4,455,819
METHOD AND APPARATUS FOR FASCIATED YARN SPINNING

Yoshihisa Suzuki, Chiryu, and Kazuo Seiki, Kariya, both of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Dec. 9, 1982, Ser. No. 448,057
Claims priority, application Japan, Dec. 21, 1981, 56-206772
Int. Cl.³ D01H 1/12, 5/28
U.S. Cl. 57—404 11 Claims

1. A method for fasciated yarn spinning, comprising:

(A) opening a sliver to individual fibers;

(B) depositing said individual fibers on a fiber collecting surface provided on the inner wall of a rotating drum rotor and holding said fibers as a fiber layer by centrifugal force;

(C) peeling said fiber layer from said fiber collecting surface to continuously form a fiber bundle by means of a guiding member rotating coaxially with said drum rotor at a faster rotational speed than that of said drum rotor and simultaneously imparting to said fiber bundle a twist proportional to the rotation of said guiding member while drawing off said fiber bundle from said drum rotor;

(D) widening said fiber bundle into a ribbon-like form by making said fiber bundle contact a deflector between said first collecting surface and said guiding member;

(E) imparting a false-twist to said fiber bundle by applying a vortex around a circumference of said widened fiber bundle, thereby forming a fasciated yarn.

6. An apparatus for fasciated yarn spinning, comprising a housing including therein;

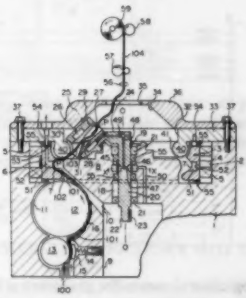
a fiber opening means for opening a supplied sliver into individual fibers;

a drum rotor supported rotatably about a rotational axis and provided with a fiber collecting surface on an inner wall thereof;

a driving means for rotating said drum rotor;

a fiber channel for transporting said individual fibers to said fiber collecting surface along with an air stream;

a central rotor comprising a center shaft supported rotatably about said rotational axis, an arm extending radially from an upper end of said center shaft, and a hollow cylindrical guiding member mounted at an outer end of said arm, an axis of said guiding member inclining so as to direct said fiber collecting surface;



a driving means for rotating said central rotor at higher rotational speed in the same direction relative to that of said drum rotor;

an air twisting nozzle provided with a yarn passage therethrough and at least a jet opening on an inner wall of said yarn passage for generating a vortex within said yarn passage, said air twisting nozzle being inserted rigidly into said guiding member;

a deflector bulged annularly about said rotational axis from an inner wall of said housing, said deflector being disposed so that opposite sides of a surface of said deflector face respectively said inner wall of said drum rotor and a rotational trace of an outer end of said guiding member with a predetermined clearance and that said axis of said guiding member passes in the vicinity of the outermost surface of said deflector.

4,455,820
CONTROL SYSTEM AND METHOD FOR CONTROLLING A GAS TURBINE IN ACCORDANCE WITH THE TEMPERATURE CONDITIONS THEREOF

Leo P. Buckley, Jr., Salem; Burnette P. Chausse, Roanoke, both of Va.; Arthur C. Chen, Schenectady; John N. Russell, Burnt Hill, both of N.Y., and Thomas Y. Wong, San Jose, Calif., assignors to General Electric Company, Salem, Va.

Filed Sep. 9, 1976, Ser. No. 721,998
Int. Cl.³ F02C 9/28
U.S. Cl. 60—39.03 10 Claims

1. A system for controlling fuel flow to a gas turbine in accordance with turbine temperature represented by the values of temperature readings provided by temperature sensors in the turbine, said system comprising:

(a) a programmable controller for providing a temperature trim signal including,

(1) a storage means for retaining a program of instructions

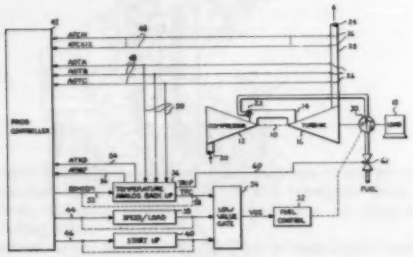
and holding data related to the calculation of said temperature trim signal,

(i) certain ones of said instructions directing said controller to determine if the value of each temperature reading is within prescribed limits and to reject those readings which are out of limits,

(ii) certain other ones of said instructions directing said controller to calculate the value of said temperature trim signal for output by said controller only when a specified number of unrejected temperature readings are within said prescribed limits, said temperature trim signal, when present, having a value proportional to the difference between a mid-value signal applied to said controller and a calculated value proportional to the average of unrejected temperature readings, and

(2) means in communication with said storage means for executing said instructions and processing said data;

(b) a signal source for generating a reference signal proportional to a safe turbine operating temperature; and,



(c) analog control means for providing a fuel control signal including,

(1) means coupled to specified ones of said temperature sensors for providing said mid-value signal to said controller, said mid-value signal having a magnitude intermediate the individual values of the temperature readings provided by said specified ones, and

(2) combining means for providing said fuel control signal, said combining means responsive to said temperature trim signal, said mid-value signal and said reference signal to provide said fuel control signal when said temperature trim signal is present at the output of said controller, and further responsive to said mid-value signal and said reference signal to provide said fuel control signal in the absence of said temperature trim signal;

(d) means for transferring the temperature readings to said controller from said temperature sensors; and

(e) means for delivering said fuel control signal from said analog means to said gas turbine for controlling fuel flow thereto.

4,455,821

101 ELECTRONIC FUEL CONTROL IGNITION INTERLOCK

Stanley G. Janik, Huntington, and Kimball J. Rumford, Fairfield, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Jan. 27, 1983, Ser. No. 461,317

Int. Cl.³ F02G 7/264

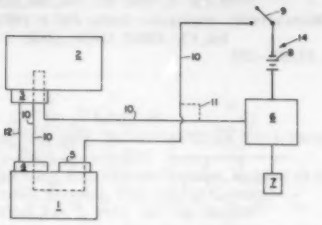
U.S. Cl. 60—39.091 **3 Claims**

1. In a fuel control system which governs the flow of fuel to the combustor of a gas turbine engine on the basis of signals supplied from a control computer to a fuel metering unit, wherein said fuel metering unit operates to provide a predetermined fuel flow upon failure of the signal from the computer, an ignition exciter circuit comprising:

an ignition exciter connected to activate a spark plug in the combustor of the gas turbine engine to initiate combustion of the fuel in the combustor;

a source of direct current connected to the ignition exciter;

a manually operated switch to close the ignition exciter circuit; and



a wiring harness interconnecting the control computer with the fuel metering unit through at least one connector assembly, said connector assembly including means connected in the ignition exciter circuit to open said circuit and prevent ignition actuation when said connector is improperly installed.

4,455,822

DEVICE TO IGNITE FUEL INJECTED IN A RAPIDLY FLOWING GASEOUS MEDIUM

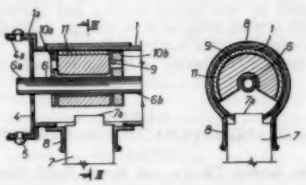
Gérard J. P. Bayle-Laboure, Paris; Mark F. B. Buisson, Le Mee sur Seine; Roger B. Linstrumelle, Dammarie les Lys, and Jean-Claude Pachot, Champigny sur Yonne, all of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, France

Filed Feb. 10, 1982, Ser. No. 347,588

Claims priority, application France, Feb. 17, 1981, 81 03046

Int. Cl.³ F02C 7/26; F02G 1/00

U.S. Cl. 60—39.822 **3 Claims**



1. In a device for igniting fuel injected into a high temperature rapidly flowing gaseous fuel medium such as in an afterburner of an aircraft turbojet engine wherein the device has a tubular sheath located in the rapidly flowing gaseous medium, a tubular conduit disposed coxially within the tubular sheath defining an annular flowpath therebetween, fuel injection means to mix atomized fuel with the high temperature gases, and direct the mixture into and through the annular flowpath and to direct fuel into and through the tubular conduit, and an electric spark device extending through the tubular sheath at a predetermined location along the annular flowpath to ignite the fuel/air mixture therein, the improvement comprising (a) a catalytic ingition element having an arcuate cross-sectional shape; and, (b) an insulating and retaining layer attached to the outer periphery of the arcuate-shaped catalytic ignition element, the layer dimensioned to frictionally engage the interior of the tubular sheath so as to retain the catalytic ignition element disposed partially about the tubular sheath in the same location along the flowpath as the electric spark device wherein the catalytic ignition element is heated to its activation temperature by contact with the high temperature gases flow-

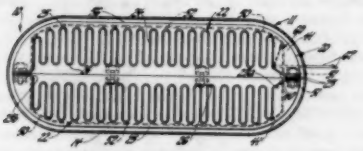
ing through the annular flowpath such that it may operate independently of the electric spark device to ignite the mixture flowing through the annular flowpath which, upon exiting the tubular sheath, ignites the fuel exiting the tubular conduit.

4,455,823

DIESEL EXHAUST PARTICULATE TRAP WITH PLEATED FILTER

Kenneth B. Bly, Pontiac; Otto A. Ludecke, Rochester, and Richard H. Smith, Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 20, 1982, Ser. No. 435,419
Int. Cl.³ F01N *3/02*
U.S. Cl. 60—311 **4 Claims**



1. A diesel engine particulate filter trap comprising a trap housing having an exhaust inlet means at one end, an exhaust outlet means at the opposite end, and an interconnecting shell; and, a particulate filter means supported in said trap housing, said particulate filter means including spaced apart inboard and outboard plate means, with said inboard end plate means having a through inlet aperture therein, a perforated and corrugated, tubular metal substrate member means fixed at opposite ends to said inboard and outboard end plate means in position to encircle said inlet aperture whereby to define a chamber of corrugated-like configuration and, a ceramic fiber filter material fixed to the chamber surface side of said substrate member means; said inboard end plate means being secured between said exhaust inlet means and said shell for defining an exhaust inlet chamber with said exhaust inlet means, said filter means downstream in terms of exhaust flow from said inlet end plate means being thus supported in spaced apart relationship to said shell whereby to form with said shell a discharge passage means which is in flow communication with said exhaust outlet means, said particulate filter thus being operative for the inside-out flow of exhaust gases whereby exhaust gas flowing into said particulate filter will have particulates removed therefrom by said ceramic fiber filter material as the exhaust gas flow therethrough to said discharge passage means.

4,455,824

WAVE MOTOR

Gustav H. Dabringhaus, Birmingham, Mich., assignor to Gustav Dabringhaus Revocable Trust, Palm Beach, Fla.

Filed Jun. 1, 1981, Ser. No. 269,390
Int. Cl.³ F03B *13/12*
U.S. Cl. 60—507 **20 Claims**

1. An apparatus for converting the periodic undulations of a body of a fluid into energy, said apparatus comprising:

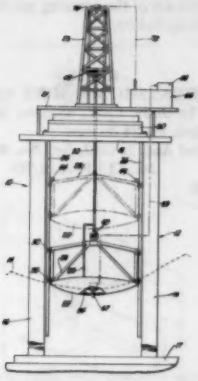
support means adapted to be mounted in a substantially fixed position relative to the surface of the body of the fluid;

float means movable relative to said support means in response to the undulations of the surface;

energy generating means mounted on said support means for generating energy;

a nut and lead screw assembly of the type comprising a threaded screw member, a threaded nut member, and bearing means disposed between said screw member and said nut member whereby said screw and nut members are axially and rotatably movable relative to each other; and

means operatively connecting one of said members of said float means and the other of said members to said generator means whereby movement of said one of said members with said float means drives said other of said members and said generator means and wherein said connecting means includes clutch means secured to said other of said members of said nut and lead screw assembly for movement therewith and having a first position engaging said



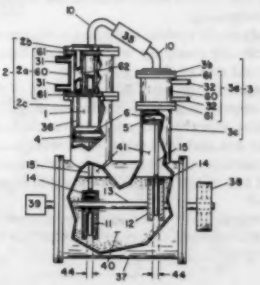
energy generating means to drive the latter to generate energy when said one member of said nut and lead screw assembly is rising and a second position disengaged from said energy generating means when said one member is falling.

4,455,825

MAXIMIZED THERMAL EFFICIENCY HOT GAS ENGINE

Adolf P. Pinto, 3209 Dalemead St., Torrance, Calif. 90505

Filed Mar. 1, 1983, Ser. No. 459,221
Int. Cl.³ F02G *1/04*
U.S. Cl. 60—517 **6 Claims**



1. An improved hot gas engine operating on the Ericsson cycle having at least one pair of cylinders, one cylinder of each pair being provided with means to heat, the other with means to cool a working gas confined within them, the paired cylinders being connected to each other by a fluid sealed gas flow path with serially connected heat regenerator, each cylinder being provided with a piston which reciprocates within the cylinder, a working gas confined in the volume defined by the paired cylinders, their pistons, and the fluid sealed gas flow path connecting the cylinders, wherein the improvement comprises means responsive to position and movement of each of the pistons for reciprocating the pistons so that the cooling cylinder piston remains at top dead center throughout working gas expansion in the heating cylinder, the heating cylinder piston remains at top dead center throughout working gas compression in the cooling cylinder, in between the aforemen-

tioned isothermal process steps the working gas is transferred from one cylinder to the other with the rate of working gas volume increase in the receiving cylinder and the rate of working gas volume decrease in the sending cylinder, at each instant of the working gas transfer step, being in the same ratio as the absolute temperatures of the working gas isothermal processes in the respective cylinders.

4,455,826

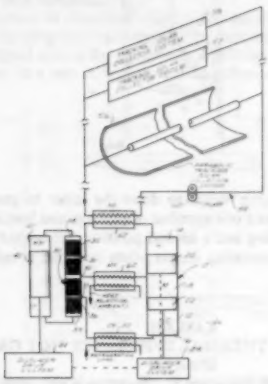
THERMODYNAMIC MACHINE AND METHOD

Stellan Knoos, La Jolla, Calif., assignor to AGA Aktiebolag, Lidingo, Sweden, a part interest

Filed Aug. 9, 1982, Ser. No. 406,257

Int. Cl.³ F02G *1/00*

U.S. Cl. 60—526 **50 Claims**



1. A thermodynamic machine for deriving thermal energy output with a useful coefficient of performance despite the existence of low temperature ratios in the working fluid for the machine, comprising:

a thermodynamic system including a regenerator and means for cyclically pumping working fluid between a hot end and a cold end of the regenerator;

means coupled to the hot and cold ends of the regenerator and in communication with the working fluid therein for providing superheated and supercooled chambers adjacent the hot and cold ends respectively;

first regenerator extension means communicating between the hot end of the regenerator and the superheated chamber; and

second regenerator extension means communicating between the cold end of the regenerator and the supercooled chamber.

4,455,827

MASTER CYLINDER AND SERVO BOOSTER ASSEMBLIES FOR VEHICLE BRAKING SYSTEMS

Hugh G. Margetts, Leamington Spa, England, assignor to Lucas Industries Limited, Birmingham, England

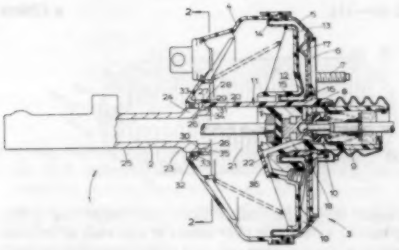
Filed Feb. 12, 1981, Ser. No. 233,988

Claims priority, application United Kingdom, Feb. 12, 1980, 8004639

Int. Cl.³ B60T *13/00*

U.S. Cl. 60—547.1 **8 Claims**

1. A master cylinder and servo booster assembly for a vehicle braking system comprising a master cylinder housing positioned in front of a booster housing, a movable wall housed within said booster housing, a booster output rod connected with said movable wall and extending forwardly therefrom for operating said master cylinder, a stationary force transmitting tube co-axial with the axis of said output rod and extending through said movable wall, means sealing said movable wall to said tube, said tube comprising a front end adjacent to said master cylinder, said front end being provided with a plurality of rearwardly extending slots which are open at their front ends and between which are defined a plurality of forwardly directed arms of said tube, a front end portion of each arm, and a rear end portion of said master cylinder housing, one of said portions being provided with a projection directed radially of said axis, and the other of said portions being provided with a complementary radially directed recess in which said projection is received, whereby each arm is secured to said master cylinder housing for transmitting braking reaction forces from



said master cylinder housing to said tube, a retaining means holding each said projection operatively engaged with the corresponding recess, and means holding said retaining means against movement relative to said booster housing, said arms being sufficiently resiliently flexible so that during assembly of said arms to said master cylinder housing, with the rear end of each said arm held at a fixed radial distance from said axis the front end of each said arm can be resiliently deflected in a radial direction to enable said master cylinder housing to be moved axially relative to said arms to being each said projection into registery with its corresponding recess.

4,455,828

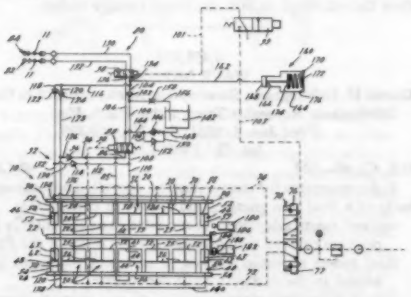
HYDRAULIC POWER UNIT

Joseph D. Snitgen, 18828 Hillcrest, Birmingham, Mich. 48009

Filed Sep. 30, 1981, Ser. No. 307,232

Int. Cl.³ B60T *13/00*

U.S. Cl. 60—547.1 **15 Claims**



1. An air operated demand only hydraulic power unit for supplying hydraulic fluid under pressure to one or more hydraulic working cylinders, each having a working piston therein, comprising:

a pneumatic first extensible fluid motor means having a first power transmitting means therein;

a solenoid operated air supply valve actuatable to a first position to place one side of said first power transmitting means in fluid communication with a pressurized source of

air and the opposite side thereof in fluid communication with atmosphere, and to a second position to place said one side of said first power transmitting means if fluid communication with atmosphere and said opposite side in fluid communication with a pressurized source of air;

a hydraulic second slave extensible fluid motor means having a second power transmitting means therein,

said second power transmitting means being operatively connected to and powered by said first power transmitting means;

first conduit means and second conduit means;

a first oil supply valve actuatable by said solenoid operated air supply valve to a first position when said air supply valve is in said first position to place one side of said second power transmitting means in fluid communication with a first conduit means and to place the opposite side thereof in fluid communication with a second conduit means, and to a second position to place said one side of said second power transmitting means in fluid communication with said second conduit means and to place said opposite side of said second power transmitting means in fluid communication with said first conduit means;

a pneumatically actuated oil control valve being connected via an advance oil conduit and a retract oil conduit to each said working cylinder and actuatable to a first position to place said first conduit means in fluid communication with said advance oil conduit and to place said second conduit means in fluid communication with said retract oil conduit and actuatable to a second position to place said first conduit means in fluid communication with said retract oil conduit and to place said second conduit means in fluid communication with said advance oil comduit;

a second solenoid operated air supply valve for actuating said oil control valve between its first and second positions;

a flow control check valve operably associated with said second conduit means, said check valve being closed when oil communication with said valve via said oil control valve is at a higher pressure than oil communicating with said valve via said oil supply valve;

oil bleed means operably associated with said second conduit means disposed on the opposite side of said check valve from said oil control valve; and intensifier means responsive to resistance in the movement of said working cylinders in either the advance or retract stroke thereof comprising,

a hydraulic third slave extensible fluid motor means having third power transmitting means therein, and conduit means for communicating pressurized oil from said third fluid motor means to said second conduit means between said check valve and said oil control valve.

4,455,829

MECHANICALLY CONTROLLED POWER BRAKE UNIT

Hermann Seip, Bad Vilbel, Fed. Rep. of Germany, assignor to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 199,405, Oct. 22, 1980, abandoned, which is a continuation of Ser. No. 019,975, Mar. 12, 1979, abandoned. This application Jul. 12, 1983, Ser. No. 512,943

Claims priority, application Fed. Rep. of Germany, Apr. 4, 1978, 2814419

Int. Cl.³ B60T *13/00*

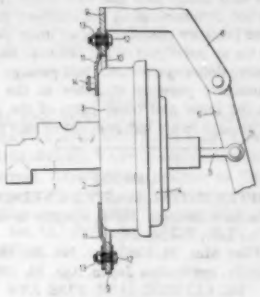
U.S. Cl. 60—547.1 **8 Claims**

1. A mechanically controlled power brake unit for an automotive vehicle comprising:

a booster utilizing the pressure difference between a vacuum and atmospheric pressure including

a vacuum casing composed of a cup shell and a cover shell, said booster being mechanically controlled by a brake pedal operable by a driver of said vehicle, at least a portion of said casing shell extending through an opening in a splash wall of said vehicle distinct from said casing, said opening encircling said portion of said casing;

a master cylinder secured to an end wall of said cup shell parallel to said splash wall, said master cylinder having a master cylinder piston therein operable by said booster; and



fastening means to fasten said casing to said splash wall, said fastening means including at least two strip-like members extending in opposite directions along a common diameter of said cup shell, each of said two members having one end fastened to said cup shell adjacent the periphery thereof and a portion adjacent the other end thereof fastened to said splash wall.

4,455,830

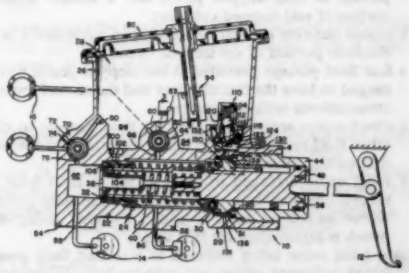
MASTER CYLINDER

Robert F. Gaiser, Stevensville; Larry G. Lohraff, Berrien Springs, both of Mich., and Lawrence R. Myers, South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sep. 2, 1981, Ser. No. 298,708

Int. Cl.³ B60T *11/20*

U.S. Cl. 60—562 **3 Claims**



1. A master cylinder comprising a housing with a longitudinal bore for receiving a pair of movable pistons, a reservoir for carrying fluid which is communicated to the bore, the pistons cooperating with the housing to substantially form a pair of pressure chambers within the bore, a bearing member disposed within the housing bore and engaging one of the pair of pistons, the bearing member cooperating with the one piston to substantially form an auxiliary pressure chamber, a pair of seals cooperating with the pistons when the pair of pistons are moved to close communication between the pair of pressure chambers and the reservoir, the one piston being movable to communicate fluid from the auxiliary pressure chamber to one of the pair of chambers, characterized by said bearing member including an end adjacent one of said pair of seals and including a radially inwardly extending integral flange engageable

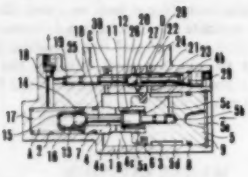
with said one piston to form an interface therebetween extending over a length on said one piston equal to or greater than the length of engagement between said one seal and said one piston, said end also defining an outer recess forming a pocket communicating with the reservoir and said end further including an opening intersecting said bearing member and extending from said auxiliary pressure chamber to said pocket, said interface between said flange and said one piston defining a first fluid passage for communicating the auxiliary pressure chamber to the one pressure chamber via an inner part of the one seal and also via an outer part of the one seal, and said bearing member opening defining a second fluid passage for communicating the auxiliary pressure chamber to the one pressure chamber via the inner and outer parts of the one seal, said second fluid passage being independent of said interface.

4,455,831

DIFFERENTIAL MASTER CYLINDER

Toshifumi Maehara, Saitama, Japan, assignor to Akebono Brake Industry Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 364,183
Claims priority, application Japan, Apr. 14, 1981, 56-56147
Int. Cl.³ B60T *11/08*; F15B *7/04*
U.S. Cl. 60—574 **6 Claims**



1. A differential master cylinder for a brake system comprising:

a cylinder body;

a stepped cylinder provided in the cylinder body;

a stepped piston slidable within the stepped cylinder;

a first chamber defined by the end of a smaller diameter portion of said stepped piston and a smaller diameter portion of said stepped cylinder;

a second chamber defined by the stepped piston and a larger diameter portion of the stepped cylinder;

a first fluid passage provided at the stepped piston and arranged to have the first chamber and the second chamber communicate with each other;

a check valve arranged in the first fluid passage to close when fluid pressure within the second chamber reaches a first setting value; and

a relief valve arranged to open to return fluid from the second chamber to a reservoir when the fluid pressure within the second chamber reaches a second setting value which is higher than the first value,

said relief valve being disposed in a second fluid passage which is formed within said cylinder body to render the second chamber communicative with the reservoir, said relief valve comprising a first valve seat disposed in the second fluid passage and a first valve body having one end thereof facing the second chamber and the other end thereof facing the reservoir, said first valve body being engaged with the first valve seat, and

said relief valve being provided with a first spring arranged to act on the first valve body in opposition to a force exerted on the first valve body by the fluid pressure of said second chamber;

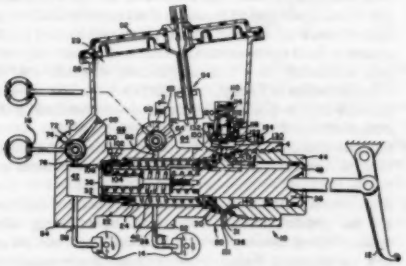
wherein said check valve comprises a second valve seat formed at the end of said first fluid passage facing said first chamber; a return piston which is arranged to slide within the larger diameter portion of said stepped piston and has one end thereof facing said second chamber and the other end thereof facing said reservoir; a second valve body biased to engage the second valve seat; and a second spring which urges the return piston to move the second valve body away from the second valve seat by causing the return piston to abut on the second valve body.

4,455,832

MASTER CYLINDER

Robert F. Gaiser, Stevensville; Larry G. Lobraff, Berrien Springs, both of Mich., and Lawrence R. Myers, South Bend, Ind., assignors to The Bendix Corporation, Southfield, Mich.

Filed Sep. 2, 1981, Ser. No. 298,707
Int. Cl.³ B60T *11/22*
U.S. Cl. 60—581 **3 Claims**



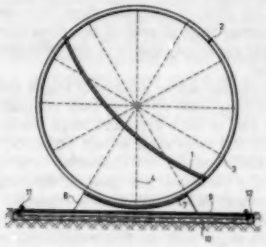
1. A master cylinder comprising a housing forming a longitudinal bore for movably receiving a pair of pistons, the housing also forming an outer wall extending substantially normal to an axis defined by the longitudinal bore to define a reservoir, the housing including a pair of ports leading from the reservoir to the longitudinal bore, the pair of pistons cooperating with the housing to substantially form a pair of pressure chambers normally communicating with the reservoir, via the pair of ports, respectively, and the housing including a pair of outlet passages communicating the pair of pressure chambers with respective brake circuits in order to communicate fluid pressure from the pair of pressure chambers to the brake circuits when the pair of pistons are moved during braking to close the pair of ports, said housing including a first boss protruding radially outwardly from said cylindrical body, said first boss forming a bore defining a portion of one of said first pair of outlet passages, said first boss further cooperating with said outer wall to substantially separate said reservoir into a pair of cavities for carrying fluid in each cavity, said first boss bore defining an axis directly above and normal to the axis of said housing bore and offset so that a passage communicates said housing bore with said first boss bore, said housing including a second boss with a bore forming an axis directly above and normal to the axis of said housing bore and offset so that another passage communicates said housing bore with said second boss bore, said first and second boss bores being disposed substantially between said housing bore and said reservoir with axes extending substantially from one side of said reservoir to an opposite side of said reservoir in order that a pair of proportioning valve assemblies can be orientated compactly relative to said housing in communication with said reservoir and said housing bore via said first and second boss bores.

4,455,833

SOLAR WHEEL

János Tiboldi, Budapest, Hungary, assignor to Vilati Villamos Automatika Fovallalkozo es Gyarto Vallalat, Budapest, Hungary

Filed May 12, 1981, Ser. No. 263,018
Claims priority, application Hungary, May 13, 1980, 1176/80
Int. Cl.³ F03G 7/02
U.S. Cl. 60—641.15 8 Claims



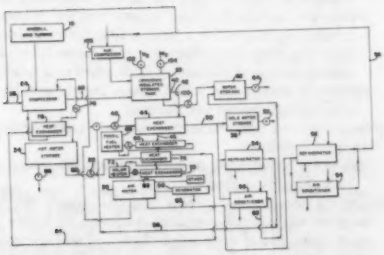
1. A power system for utilizing solar energy, comprising a carrier, conversion means on the carrier for converting heat to another form of energy, reflector means on the carrier for focusing sunlight on said conversion means, means for rotating said carrier about a vertical axis in synchronism with the apparent daytime motion of the sun, means for rotating said carrier about a horizontal axis in synchronism with the apparent daytime motion of the sun, said carrier comprising a circular table having a substantially horizontal platform and a substantially vertical circular wall about the outer portion of the underside of said table, said table and wall being airtight, said wall being immersed in a basin which contains liquid and which has a greater free surface than the outer periphery of said table, there being an air cushion between the surface of the liquid and the underside of the table within said wall.

4,455,834

WINDMILL POWER APPARATUS AND METHOD

John L. Earle, P.O. Box 185, Forest Grove, Oreg. 97116

Filed Sep. 25, 1981, Ser. No. 305,666
Int. Cl.³ F01K 25/10; F03D 9/02
U.S. Cl. 60—659 32 Claims



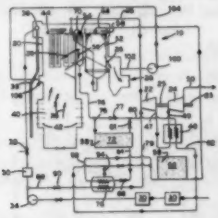
1. Windmill power apparatus comprising
windmill means for converting wind into compressor-operating energy,
compressor means operatively driven by the windmill means for compressing a gaseous fluid to a relatively high pressure,
storage means for accumulating compressed fluid in a liquid state, said storage means having outlet means for releasing accumulated fluid under pressure, and
fluid motor means for receiving fluid released by the outlet means and being operatively driven thereby,
heat extracting means connected to the compressor means for retracting heat of compression generated in compressing the gaseous fluid, wherein the heat extracting means comprises cooling circuit means for circulating coolant through the compressor means, fluid circuit means for circulating heat storage fluid and heat exchange means for communicating heat from the coolant to the heat storage fluid, and further comprising second heat exchange means for communicating heat from the heat storage fluid to the fluid released from the outlet means before said released fluid enters the fluid motor means.

4,455,835

THERMAL ENERGY STORAGE AND RECOVERY APPARATUS AND METHOD FOR A FOSSIL FUEL-FIRED VAPOR GENERATOR

Oliver W. Durrant, Akron, Ohio, assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Jan. 17, 1983, Ser. No. 458,675
Int. Cl.³ F01K 3/00; F28D 13/00
U.S. Cl. 60—659 17 Claims



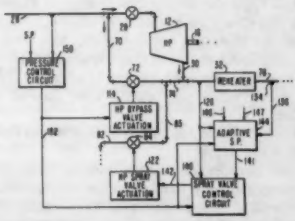
1. A method for storing excess thermal energy of a fossil fuel-fired vapor generator and for recovering the stored thermal energy for use comprising:
a. flowing a moving bed of refractory particles in heat exchange relation with flue gases produced by the vapor generator to receive thermal energy from the flue gases;
b. storing at least a portion of the hot refractory particles; and
c. flowing at least a portion of the moving bed of hot refractory particles in heat exchange relation with a fluid to impart thermal energy to the fluid for use.

4,455,836

TURBINE HIGH PRESSURE BYPASS TEMPERATURE CONTROL SYSTEM AND METHOD

Morton H. Binstock, Pittsburgh, Pa.; Thomas H. McCloskey, Palo Alto, Calif., and Leaman B. Podolsky, Wilmington, Del., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 25, 1981, Ser. No. 305,814
Int. Cl.³ F01K 7/22
U.S. Cl. 60—663 22 Claims



1. High pressure temperature control apparatus for a steam turbine system having a steam generator, a high pressure tur-

bine, at least one lower pressure turbine, a reheater in the steam flow path between said high and lower pressure turbines, and a steam bypass path for bypassing said turbines comprising:

(A) high pressure bypass valve means in said steam bypass path for controlling the introduction of steam into said bypass path;

(B) means for controlling said high pressure bypass valve means in response to predetermined pressure conditions of said system;

(C) means for measuring the temperature of the steam at the input and output of said reheater for providing respective cold and hot reheat temperature signals indicative thereof; and

(D) means for regulating the temperature of the steam passed by said high pressure bypass valve means as a function of both said cold and hot reheat temperature signals.

4,455,837

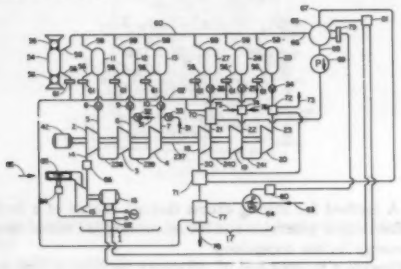
CYCLIC VELOX BOILER

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115

Filed Oct. 27, 1983, Ser. No. 546,093

Int. Cl.³ F01K *13/00*

U.S. Cl. 60—670 **14 Claims**



1. The combination of a cyclic oxidation char gasifier plant comprising:

at least one compressor means for compressing gases from a lower pressure to a higher pressure and each such compressor means comprising at least one stage and each such stage comprising an inlet and an outlet end;

at least one expander means for expanding gas from a higher pressure to a lower pressure and each such expander means comprising at least one stage and each such stage comprising an inlet end and a discharge end;

at least two separate containers, each of said containers comprising pressure vessel means for containing char fuel and any gas compressed into said char fuel, each such container comprising interior surfaces on the combustion side;

power means for driving said compressors and for absorbing any mechanical work done upon said expanders by said expanding gas;

each such expander means comprising an expander discharge;

at least one char fuel heater, said char fuel heater comprising means for heating a portion of the char fuel within each of said containing means to that temperature at which said char will react rapidly with oxygen in adjacent compressed reactant gases when said cyclic char gasifier plant is being started;

at least one reactant gas supply source of gas containing appreciable oxygen gas;

each such compressor whose number of stages exceeds one further comprising fixed open gas flow connections from the outlet end of each compressor stage, except one, to the inlet end of one other stage of said compressor, whereby said stages of said compressor are connected in series so that the pressure of a particular gas means, at delivery from each stage, increases as said gas mass is compressed through said series connected stages, from the inlet end to the outlet end of each stage, with the first stage in said series through which a gas mass first flows being both the lowest pressure stage and also that one stage whose inlet end does not have a fixed open gas flow connection from the outlet end of any other stage of said compressor, and with the last stage in said series through which a gas mass last flows being both the highest pressure stage and also that one stage whose outlet end does not have a fixed open gas flow connection to the supply end of any other stage of said compressor;

fixed open gas flow connections from the inlet end of the lowest pressure stage of each of said compressors to at least one reactant gas supply source of gas containing appreciable oxygen gas;

each such expander whose number of stages exceeds one further comprising fixed open gas flow connections from the discharge end of each expander stage, except one, to the inlet end of one other stage of said expander, whereby said stages of said expander are connected in series so that the pressure of a particular gas mass, at discharge from each stage, decreases as said gas mass is expanded through said series connected stages, from the inlet end to the discharge end of each stage, with the first stage in said series through which a gas mass first flows being both the highest pressure stage and also that one stage whose inlet end does not have a fixed open gas flow connection from the discharge end of any other stage of said expander, and with the last stage in said series through which a gas mass last flows being both the lowest pressure stage and also that one stage whose discharge end does not have a fixed open gas flow connection to the inlet end of any other stage of said expander;

fixed open gas flow connections from the discharge end of the lowest pressure stage of each of said expanders to said expander discharge;

changeable gas flow connections, which are openable and closeable, from each of said containers to each outlet end of each stage of each of said compressors and to each inlet end of each stage of each of said expanders;

each cyclic char gasifier plant comprising a number of said containers, with changeable gas flow connections to said compressors and to said expanders, at least equal to the sum of the number of comressor stages of all compressors, and the number of expander stages of all expanders;

at least one refuel mechanism, said refuel mechanism comprising;

means for transferring a volume of solid materials from a supply source into said containing means when said refuel transfer means is connected to said containing means;

means for connecting said refuel transfer means to said containing means for a time period for refueling and for disconnecting said refuel transfer means from said containing means at the end of said refuel time period;

means for sealing said refuel means for connecting and disconnecting against gas leakage;

at least one coke removal mechanism, said coke removal mechanism comprising;

means for transferring a volume of non-gas materials out of said containing means;

means for opening and closing said changeable gas flow connections so that each container is opened for a time period to each outlet end of each stage of each of said compressors, in a sub-sequence of time periods of open gas flow connections to compressors, said sub-sequence proceeding in time order of increasing compressor stage delivery pressure, and is opened for a time period to each inlet end of each stage of each of said expanders, in a sub-sequence of time periods of open gas flow connections to expanders, said sub-sequence proceeding in time order of decreasing expander stage inlet pressure, said sub-sequence of connections to said compressors being followed by said sub-sequence of connections to said expanders, and these together comprise one sequence of time periods of open gas flow connections, each of said containers is opened to only one stage during any one time period of said sequence of time periods, said sequence of

time periods of open gas flow connections to said compressors and to said expanders is repeated for each of said containers by said means for opening and closing;

means for controlling said means for opening and closing, and said means for connecting said refuel transfer means and said coke removal transfer means, so that said repeated sequences of time periods of open gas flow connections, and any time periods available only for refueling and for coke removal, are a continuous series of time periods for any one containing means, and so that the delivery end of each stage of each compressor has an open gas flow connection to one containing means, and the inlet end of each stage of each expander has an open gas flow connection to one containing means, during all time periods, whenever said plant is operating;

wherein the improvement comprises adding thereto:

boiler means for heating and boiling liquid water at pressure and for heating steam at pressure, and comprising a boiler feedwater inlet and a boiler steam outlet, at least one portion of said boiler means comprising at least one radiant heater means positioned on the interior surfaces of one of said containers, each such radiant heater comprising a liquid water inlet and a water outlet;

a source of boiler feedwater;

feedwater pumping means for pumping liquid water into said boiler means from said feedwater supply source and comprising a drive means for driving said feedwater pump and a control means for controlling the flow rate of water pumped;

feedwater pump connecting means for connecting said feedwater pumping means to said boiler means and to said feedwater supply source so that liquid water is forced into said boiler liquid water inlet whenever said plant is operating;

sensor and control means for sensing the quantity of char fuel within each said container when said plant is operating and operative upon said means for connecting said refuel transfer means so that, when the volume of char fuel within any one container becomes less than a minimum set value, said refuel transfer means is connected to that container by said means for connecting said refuel means, and when the volume of char fuel within any one said container exceeds a maximum set value, said refuel transfer means is disconnected from that container by said means for connecting said refuel means;

whereby said cyclic oxidation char gasifier plant becomes a cyclic Velox boiler plant.

4,455,838

CONTROL DEVICE FOR A BALANCING APPARATUS

Kita Junichi, and Toshio Nagahara, both of Toyama, Japan, assignors to Toyama Machine Works, Ltd., Toyama, Japan

Filed Feb. 16, 1982, Ser. No. 349,099

Claims priority, application Japan, Feb. 16, 1981, 56-21233

Int. Cl.³ F01B *21/04*

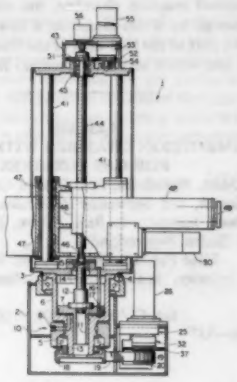
U.S. Cl. 60—711 **9 Claims**

1. A balancing pressure control device, comprising:

a main circuit including a pressure control valve having a pilot valve connected between a balancing cylinder and a pressurized fluid source, to supply a pressurized fluid at a predetermined pressure to said cylinder;

a first control circuit for applying a control pressure corresponding to a fixed load on a part to be balanced by said cylinder to a pilot pressure input terminal of said pressure control valve; and

a second control circuit for detecting a variable load applied to said part to be balanced, for producing a control pressure corresponding to the variable load, and for applying



said control pressure thus produced to said pilot pressure input terminal of said pressure control valve.

4,455,839

COMBUSTION CHAMBER FOR GAS TURBINES

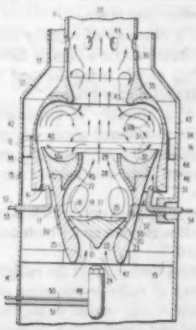
Gerhard Wuchter, Wolfschlugen, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 18, 1980, Ser. No. 188,458

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1979, 2937631

Int. Cl.³ F02G *3/00*

U.S. Cl. 60—737 **12 Claims**



1. A combustion chamber for gas turbines, comprising

a flame tube and a truncated cone-shaped insert projecting into said tube surrounding a first generally spheroidal reaction chamber and a coaxially connecting second reaction chamber, with

a first premixing chamber equipped with a central fuel-injection nozzle therefor, the first premixing chamber, having an outside wall which is formed by a part of an interior side of the insert and an inside wall which is formed by a part of an outside of a coaxial conical fitting that serves as a flame holder, and

another premixing chamber equipped with fuel injection nozzles, an outside wall of which is formed by a part of an interior side of the flame tube, and an inside wall of which is formed by a part of an outside of the insert, wherein

the first generally spheroidal reaction chamber generally

defined by the insert and fitting includes an inwardly protruding bulge proximate an outlet opening leading into the second reaction chamber, the outlet opening being surrounded by a rim including a concave trough which forms a part of the base area of the truncated cone-shaped insert and which serves as a second flame holder.

4,455,840

RING COMBUSTION CHAMBER WITH RING BURNER FOR GAS TURBINES

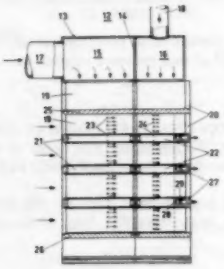
Bernhard Matt, Rheinheim, Fed. Rep. of Germany; Theo Woringer, Zurich, and Gerassime Zouzoulas, Dietikon, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Feb. 18, 1982, Ser. No. 349,853

Claims priority, application Switzerland, Mar. 4, 1981, 1439/81

Int. Cl.³ F02G *3/00, 1/00*

U.S. Cl. 60—737 **5 Claims**



1. A ring combustion chamber for a gas turbine, said ring combustion chamber comprising:

(a) an array of a plurality of radially extending canals uniformly distributed about a central axis, each of said radially extending canals being formed from two pairs of generally parallel planar plates;

(b) an array of a plurality of circumferentally extending canals radially distributed about said central axis, each of said circumferentially extending canals:

(i) being formed from two pairs of generally parallel planar plates;

(ii) having an upstream end which is open to combustion air and a downstream end which communicates with a turbine; and

(iii) intersecting with each of the radially extending canals in said array of radially extending canals, whereby the intersections of the canals in the two arrays of canals form a grid-like canal system composed of honeycomb cells of generally trapezodial cross section;

(c) a first array of nozzles for the introduction of ignition gas into each canal in said array of circumferentially extending canals, said first array of nozzles being located in a first plane perpendicular to said central axis; and

(d) a second array of nozzles for the introduction of primary gaseous fuel into each canal in said array of circumferentially extending canals, said second array of nozzles being located in a second plane perpendicular to said central axis, said second plane being downstream of said first plane,

whereby said grid-like canal system and said nozzles define an array of burner elements uniformly distributed around said central axis, said burner elements being stacked one upon another in both the radial and circumferential directions.

4,455,841

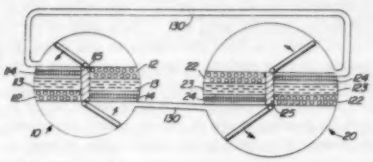
HEAT-ACTUATED HEAT PUMPING APPARATUS AND PROCESS

Jaroslav Wurm, North Riverside, and John A. Kinast, Chicago, both of Ill., assignors to Institute of Gas Technology, Chicago, Ill.

Filed Nov. 26, 1982, Ser. No. 444,803

Int. Cl.³ F25B *9/00*

U.S. Cl. 62—6 **21 Claims**



1. A heat-actuated space conditioning apparatus comprising two modules, a first module functioning as the pressure driver for heat pumping action of the second module, said apparatus comprising:

a first pressure driving module comprising a first casing defining a first cylindrical chamber for confining gas, a high temperature thermal exchange means, a thermal regenerative means having one side adjacent said high temperature thermal exchange means, a first intermediate temperature thermal exchange means adjacent the other side of said thermal regenerative means, each said high temperature thermal exchange means, said thermal regenerative means, and said first intermediate temperature thermal exchange means adjacently extending for substantially the length of said first chamber and from said casing toward the center of said first chamber, an oscilliating displacer dividing said first chamber into a first intermediate temperature volume and a higher temperature volume and by oscillatory movement displacing said gas from said intermediate temperature volume sequentially through said first intermediate temperature thermal exhange means, thermal regenerative means and high temperature thermal exchange means to said higher temperature volume at a higher average temperature-pressure, and displacing said gas in a reverse direction from said higher temperature volume to said first intermediate temperature volume at a lower intermediate average temperature-pressure;

a second heat pumping module comprising a second casing defining a second cylindrical chamber for confining gas, a low temperature thermal exchange means, a thermal regenerative means having one side adjacent said low temperature thermal exchange means, a second intermediate temperature thermal exchange means adjacent the other side of said thermal regenerative means, each said low temperature thermal exchange means, said thermal regenerative means, and said second intermediate temperature thermal exchange means adjacently extending for substantially the length of said second chamber and from said casing toward the center of said second chamber, an oscillating displacer dividing said second chamber into a second intermediate temperature volume and lower temperature volume and by oscillatory movement displacing said gas from said second intermediate temperature volume sequentially through said intermediate temperature thermal exchange means, thermal regenerative means and low temperature thermal exchange means to said lower temperature volume at a lower average temperature-pressure, and displacing said gas in a reverse direction from said lower temperature volume to said second intermediate temperature volume at a higher intermediate average gas temperature-pressure; and

pressure communication means between said first intermedi-

ate temperature volume of said first chamber in the vicinity of said first intermediate temperature thermal exchange means and said second intermediate temperature volume of said second chamber in the vicinity of said intermediate temperature thermal exchange means.

4,455,842

DEVICE AND METHOD FOR CONTROLLED FREEZING OF CELL CULTURES

David J. Granlund, Rockville, Md., assignor to Biotech Research Laboratories, Inc., Rockville, Md.

Division of Ser. No. 283,634, Jul. 15, 1981, Pat. No. 4,377,077. This application Sep. 27, 1982, Ser. No. 423,744

Int. Cl.³ F25D *17/02*

U.S. Cl. 62—64 **6 Claims**

1. A method of freezing cell cultures contained in one or more cell culture vials which comprises the steps of:

(a) at least partially filling a container with a prescribed volume of liquid refrigerant;

(b) supporting the culture vials so that the cell culture contained therein can be submersed in the liquid refrigerant;

(c) submersing at least the portion to the vial containing the cell culture into the liquid refrigerant so that the liquid refrigerant surrounds the vial portion submersed and the cell culture is below the refrigerant liquid level;

(d) said prescribed volume of liquid refrigerant being more than 15 times the total volume of cell culture to be frozen; and

(e) placing the container with culture vials submersed in the liquid refrigerant in a conventional freezer at a temperature below about −70° C.

4,455,843

ICE MAKING MACHINE FOR SELECTIVELY MAKING SOLID AND HOLLOW ICE

James H. Quarles, 818 Woodmore La., Chattanooga, Tenn. 37411

Continuation-in-part of Ser. No. 236,432, Jun. 21, 1981, abandoned. This application May 19, 1982, Ser. No. 379,830

Int. Cl.³ F25C *5/10*

U.S. Cl. 62—73 **22 Claims**

1. An ice making machine for selectively forming hollow ice and solid ice, said machine comprising:

mode select means for selecting whether solid ice is to be formed in accordance with a first mode or hollow ice is to be formed in accordance with a second mode;

means defining a water circuit, said water circuit including a tube wherein ice is formed;

means for introducing water into said water circuit;

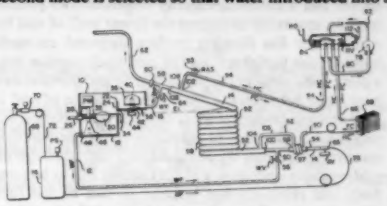
means defining a refrigerant circuit, at least a portion of said refrigerant circuit disposed in heat exchange relationship about at least a portion of said tube;

means for circulating a refrigerant through said refrigerant circuit in heat exchange relation with water in said tube to form a deposit of ice on an inner wall of said tube;

valve means for selectively communicating said tube with the remainder of said water circuit;

sensor means for determining when ice is sufficiently formed in said tube;

pump means responsive to said mode select means, said pump means being unactivated when said first mode is selected so that water introduced into said water circuit is substantially non-circulating for the production of solid ice when said refrigerant is circulated through said refrigerant circuit, said pump means being activated when said second mode is selected so that water introduced into said



water circuit is circulated for the production of hollow ice when said refrigerant is circulated through said refrigerant circuit, said pump means further being responsive to said sensor means for terminating the circulation of water through said water circuit once hollow ice is sufficiently formed in accordance with said second mode;

means responsive to said sensor means for initiating a thawing operation by supplying hot refrigerant to said portion of said refrigeration circuit about said tube so as to sufficiently loosen said ice so that said ice may be discharged from said tube; and,

means for discharging ice from said tube.

4,455,844

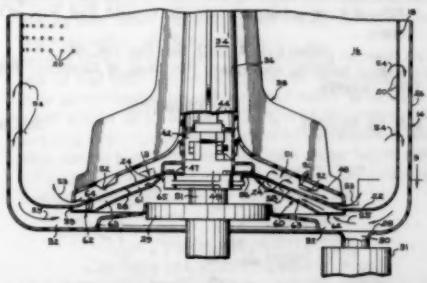
SELF-CLEANING UNDER BASKET LINT FILTER FOR AUTOMATIC WASHERS

Stephen L. McMillan, and Robert R. Cureton, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Aug. 4, 1983, Ser. No. 520,493

Int. Cl.³ D06F *13/02, 39/10*

U.S. Cl. 68—18 F **1 Claim**



1. A washing machine of the vertical axis type including an outer imperforate tub having a side wall and a bottom wall for containing a liquid;

a basket mounted in the tub on said vertical axis for containing articles to be washed and having a perforated side wall and lower wall sloping upwardly from a lower portion at the outer circumference of said side wall toward said central axis, said basket lower wall adjacent said bottom wall of the tub including circumferentially spaced openings being spaced from said vertical axis;

agitating means mounted in said basket on said vertical axis for rotation relative to said basket;

drive means connected to said basket for spinning said basket during a liquid extraction operation and for oscillating said agitating means during a washing operation;

a disc shaped filter means mounted for rotation with said basket including an imperforate portion extending from a central portion adjacent said vertical axis in contact with the lower wall of said basket to a body portion arranged in spaced parallel relationship with the lower wall of said basket and a circumferentially disposed wall portion extending upwardly to engage the lower wall of said basket, a relatively flat filtering surface disposed circumferentially on the peripheral end of said body portion being in a plane substantially perpendicular to said vertical axis and positioned between the outer lower portion of said lower wall and the bottom wall of the tub, said filtering surface including a plurality of openings being dimensioned for removing lint from liquid circulating therethrough during said washing operation and for causing lint to be removed from said relatively flat filtering surface by the shearing force between the spinning basket and the liquid in said tub during the initial portion of said extraction operation;

agitator driven pump means defined between said agitator and said lower wall of said basket, impelling vanes on said agitator located radially outwardly from said circumferentially spaced openings in said basket for causing liquid circulating during said washing operation to flow upwardly from said tub through said filtering surface and into said basket and outwardly through said circumferentially spaced openings to be returned to said tub, thereby preventing lint from returning to said basket during said washing operation; and

basket driven pump means including liquid impelling vanes on said filter means disposed between said filter and said lower wall of said basket located radially outwardly from said circumferentially spaced openings defining a pump means for causing liquid to flow downwardly from said basket through said circumferentially spaced openings and said filtering means for backflushing and removing lint from said filtering surface during said extraction operation.

4,455,845

APPARATUS FOR FORMING PATTERNS IN MATERIALS SUCH AS TEXTILE GOODS

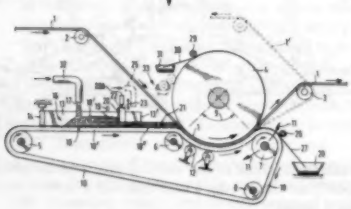
Günter Schiffer, Krefeld, Fed. Rep. of Germany, assignor to Eduard Kusters Maschinenfabrik, Krefeld, Fed. Rep. of Germany

Filed Feb. 4, 1982, Ser. No. 345,763

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1981, 3103894

Int. Cl.³ D06B *1/10*

U.S. Cl. 68—204 **30 Claims**



1. Apparatus for forming patterns on a substrate, comprising:

a flat support movable longitudinally,

a plurality of laterally spaced partitions extending generally longitudinally and forming a plurality of laterally adjacent, longitudinally extending lanes on said support,

means for moving said support longitudinally past said partitions,

means for introducing dye-containing foams into said lanes and onto said support to form longitudinal lanes of foam on said support,

a plurality of height-regulating means for selectively regulating the heights of foam independently in each of said lanes,

means for moving the substrate longitudinally into engagement with the lanes of foam such that the latter are transferred onto the substrate to form longitudinal patterns thereon, and

means for actuating said height-regulating means independently on one another during movement of the support to longitudinally vary the foam lane height and thereby longitudinally vary the resulting pattern formed on the substrate.

4,455,846

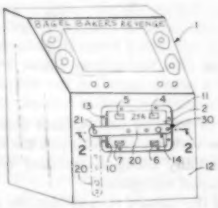
SECURITY LOCK FOR COIN OPERATED MACHINES

Louis Wichinsky, Hurleyville, N.Y.

Filed Jan. 10, 1983, Ser. No. 432,990

Int. Cl.³ E05B *65/00*

U.S. Cl. 70—94 **9 Claims**



1. A security mechanism for locking coin operated vending and gaming machines of the type having a coin box and openable access means for concealing said coin box within the machine comprising, in combination, a flat security bar pivotally connected to the machine adjacent the access means for movement between an open position fully exposing the access means and a locked position extending across and in close juxtaposition to the access means to prevent opening of the same; means for pivotally connecting one end of the security bar to the coin operated machine; means associated with said pivot means for biasing the security bar into contact with the access means in the locked position of said security bar and permitting limited lateral movement of said security bar during its pivotal movement between the open and locked positions; a key operated lock fixedly disposed on the access means having a lever with a notched end connected thereto for movement with the lock between open and locked positions on the interior of the access means; a lock pin connected to the security bar at the end opposite the pivot means; said pin extending into the machine to a position adjacent the access means and having a groove at one end thereof for engagement by the notched end of the locking lever of the key operated lock in its locked position to secure both the access means and the security bar in their locked positions.

4,455,847

LOCKING DEVICE OF A COMBINATION LOCK

Sheng-Hu Hung, 10-4 Fl., No. 62, Chang Chun Rd., Taipei, Taiwan

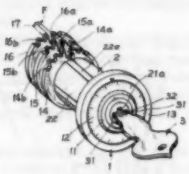
Filed Jun. 15, 1982, Ser. No. 388,647

Int. Cl.³ E05B *37/04, 27/06*

U.S. Cl. 70—284 **1 Claim**

1. An improved locking device of combination lock comprising:

a combination lock having toothed combination wheels;
a three-way locking means, forming as the shaft of the combination lock and having a pin tumbler cylinder, an outer lock body inserted in tumbler cylinder, and an innermost cylinder connected with tumbler cylinder;
a three-extension key corresponding the key hole of said locking means; and
a rear locking pin normally poking into the rear portion of said key hole of said locking means to prevent from turning the combination lock for enhancing security; the improvement which comprises:
a pin tumbler cylinder and an innermost cylinder of said locking means forming as a shaft of said combination lock;



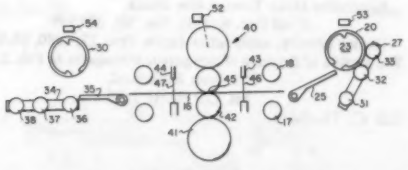
teeth formed on perimeter of each combination wheel which is coaxially formed on the shaft of said combination lock; and
a rear locking pin comprises two side extensions, a central extension and a rear extension; the width of said side extensions being slightly smaller than the diameter said key hole of said locking means, the width of said rear extension being larger than the diameter of said key hole, the front portion of said side and central extensions being made acute portion, said rear locking pin, backed by a spring inserted in a recess of said innermost cylinder, poking into the rear portion of said key hole for locking use, whereby said key is inserted into key hole to release said pin tumbler cylinder from said outer lock body for free turning said combination lock for opening the lock.

4,455,848

APPARATUS FOR UNDERWINDING STRIP ON A DRUM IN A HOT REVERSING MILL

George W. Tippins; John E. Thomas; Richard S. Connolly, all of Pittsburgh; Charles K. Pine, Gibsonia, and Wayne G. Pottmeyer, Murrysville, all of Pa., assignors to Tippins Machinery Company, Inc., Pittsburgh, Pa.

Filed Sep. 13, 1982, Ser. No. 417,423
Int. Cl.³ B21B *37/00, 41/06, 1/34*
U.S. Cl. 72—12 **4 Claims**



1. In a hot reversing mill having coiler drums on opposite sides thereof along a passline defined by a series of table rolls, the improvement comprising means for underwinding the coiler drum including:
A. each of said drums having an entry slot and an enlarged shoulder inward of and adjacent said slot;
B. a pair of gates, each positioned along said table rolls and adjacent to said drum rotating upward to deflect a strip into said slot;
C. a tilt table roll assembly on each side of said mill adapted to pivot into engagement with a drum donwstream of said slot to retain said strip against a portion of said drum;
D. detection means positioned between each drum and said mill along said passline to detect the presence of said strip;
E. activation means responsive to said detection means for causing each drum to rotate in an underwinding direction when said strip enters said slot and to speed match each drum to said strip; and
F. converting means for converting each drum from a surface winding mode to a center driven tension mode after a given number of wraps of said strip around said drums.

4,455,849

PRESS-ROLLING PROCESS FOR PRODUCING A METAL TUBULAR PRODUCT

Shigeru Uchida; Kazuo Watanabe; Kousaku Ozawa, all of Kitakyushu, and Minoru Kawaharada, Sakai, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Apr. 20, 1981, Ser. No. 255,482
Claims priority, application Japan, Apr. 21, 1980, 55-51778
Int. Cl.³ B21B *17/10*
U.S. Cl. 72—41 **3 Claims**

1. In a press-rolling process for producing a metal tubular product in a rolling mill having a pair of rollers arranged opposite to each other in the vertical direction wherein said rollers have semi-circular grooves forming a circular shape, said process including the steps of:
feeding a square metal billet having a forward surface and a rearward surface into said rolling mill by applying a pressure on said rearward surface in the axial direction of said billet with a pusher;
providing a plug held in the center line of said circular shape formed by said semi-circular grooves whereby said plug is aligned with the center portion of said billet being fed into said rolling mill;
positioning said plug such that a portion of said plug is located beyond the axial center line of said rolling mill on the side of said rolling mill where said billet is inserted by said feeding step;
allowing said plug to pierce said billet by continuing said feeding step thereby producing said tubular product; the improvement in which comprises:
forming a cavity in the center portion of said forward surface of said billet and open only at the forward surface prior to said feeding step wherein said cavity has a diameter of at least 70% but less than 100% of the diameter of said plug and a volume at least equal to the volume of said plug portion located beyond said axial center line of said rolling mill on said billet inserting side whereby said plug is inserted into said cavity by said feeding step.

4,455,850

CAN MANUFACTURE

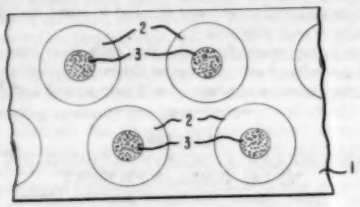
Jan M. B. Switten, St. Katelyne Waver, Belgium, assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

PCT No. PCT/US81/01749, 371 Date Aug. 30, 1982, 102(e) Date Aug. 30, 1982, PCT Pub. No. WO82/02349, PCT Pub. Date Jul. 22, 1982
PCT Filed Dec. 28, 1981, Ser. No. 414,531
Claims priority, application PCT Int'l. Appl., Dec. 31, 1980, PCT/US80/01757
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—46 **3 Claims**

1. A process for making a cylindrical can body with one end

closed from a sheet of metal by a deformation process, said closed end having a reentrant convex shape, wherein

first only the area of said sheet which will become the outside surface of said closed end is coated with a flexible



coating composition which gives a matte finish, minimizing specular reflectance of light from said area,

then the can body is formed from said sheet by a deformation process.

4,455,851

SWAGING MACHINE

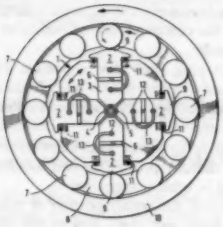
Klaus Kienhöfer, Niefern-Öschelbronn, Fed. Rep. of Germany, assignor to Gebr. Felss, Konigsbach-Stein, Fed. Rep. of Germany

Filed Feb. 10, 1983, Ser. No. 465,442

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1982, 3205585

Int. Cl.³ B21J *13/02*

U.S. Cl. 72—76 **5 Claims**



1. In a swaging machine which defines a path for a workpiece to be swaged and comprises

a plurality of dies, which are spaced around and radially movable with respect to said path,

a plurality of rams, which are spaced around said path and radially outwardly of and radially aligned with respective ones of said dies and radially movable with respect to said path and to said dies,

die-actuating means operable to oscillate said dies radially with respect to said path with the aid of said rams, and

ram-biasing means urging each of said die-actuating rams radially outwardly,

the improvement residing in that

each of said dies and said die-actuating ram which is radially aligned with said die are formed with respective bores, which are parallel to each other, and

a plurality of U-shaped springs are provided, each of which has two legs, which extend into respective ones of said bores formed in one of said dies and in the die-actuating ram which is radially aligned with said die.

4,455,852

METHOD FOR PRODUCING SHAPES HAVING CIRCULAR CORRUGATIONS

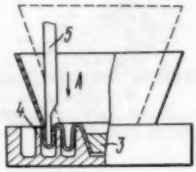
Boris E. Paton; Vladimir N. Samilov, both of Kiev; Grigory P. Ivaschenko; Alexandr V. Krasjukov, both of Dnepropetrovsk, all of U.S.S.R., and Vladimir M. Balitsky, deceased, late of Kiev, U.S.S.R. (by Oxana V. Balitskaya, administrator), assignors to Institut Elektrosvarki Imeni E. O. Patona, Kiev, U.S.S.R.

PCT No. PCT/SU80/00089, 371 Date Jan. 26, 1982, 102(e) Date Jan. 26, 1982, PCT Pub. No. WO81/03442, PCT Pub. Date Dec. 10, 1981

PCT Filed May 30, 1980, Ser. No. 346,050

Int. Cl.³ B21D *22/14, 22/18, 15/04*

U.S. Cl. 72—82 **6 Claims**



1. A method for producing shapes having circular corrugations by means of a spinning process, said method comprising:

(a) providing a blank in the form of a closed envelope of revolution having a continuously diverging flare;

(b) securing the blank against a die having a plurality of spaced concentric ribs defining spaced concentric grooves therebetween of different diameters;

(c) providing a first spinning tool;

(d) spinning the blank about its axis;

(e) aligning the spinning tool with one of the grooves in the die;

(f) moving the spinning tool relative to the blank toward the die to provide a deforming force to form a corrugation wall;

(g) withdrawing the spinning tool from the corrugation wall;

(h) moving the tool radially relative to the spinning axis to align the tool with another groove in the die;

(i) moving the spinning tool relative to the blank toward the die to provide a deforming force to form a second corrugation wall; and

(j) withdrawing the tool from the other groove.

4,455,853

METHOD OF MAKING POLY-V PULLEYS

Yukio Kanemitsu, Hyogo, Japan, assignor to Goshi Kaisha Kanemitsu Doko Yosetsu-sho, Japan

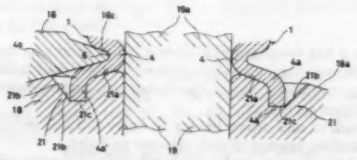
Filed Dec. 9, 1981, Ser. No. 328,929

Claims priority, application Japan, Dec. 27, 1980, 55-189161

The portion of the term of this patent subsequent to Feb. 2, 1999, has been disclaimed.

Int. Cl.³ B21H *1/00*

U.S. Cl. 72—84 **1 Claim**



1. A method for making poly-V pulleys, comprising the steps of:

pre-forming a cup-shaped blank, having a cylindrical flange wall and an opening end flange wall edge, by pressingly deforming the inner and outer circumferential surfaces of said flange wall, thereby forming a corrugated wall having a series of round valleys and crests around the outer circumference of said flange wall;

compressing said pre-formed flange wall of said cup-shaped blank by vertically moving a pair of upper and lower rotary pressing forms which pressingly support said cup-shaped blank therebetween, and while rotating said pair of pressing forms, pressing auxiliary rollers into the valleys of said corrugated wall of said cup-shaped blank, thereby forming said corrugated wall of said cup-shaped blank into a V-grooved wall having a series of sharp crests and valleys, the opening end edge of the flange wall tending to become misshapen;

during said forming, preventing the opening end edge of said pre-formed flange wall from becoming misshapen, during the compressing and rotating, by retaining the opening edge in a flat bottom portion of a fitting groove formed in the upper peripheral edge of said lower rotary pressing form;

during said forming, controlling the angle of inclination assumed by the portion of the flange wall forming the lowest V-groove during the compressing and rotating, by bending said portion of the flange wall against an engagement slope formed around the inner circumference of the fitting groove, the engagement slope having a predetermined upward inclination in the radially inward direction toward the axis of said pressing forms;

during said forming, preventing the opening end edge from bending radially outwardly during the compressing and rotating, by surrounding the outer circumference of the fitting groove with a flank having a predetermined upward inclination in the radially outward direction from the axis of said pressing forms; and,

finishing said V-grooved wall of said cup-shaped blank by rotating said cup-shaped blank while radially pressing a finishing roller into the valleys of said groove wall formed during the compressing and rotating, thereby forming sharply defined and evenly spaced poly-V grooves in the flange wall.

4,455,854

MILL FOR TRANSVERSE ROLLING

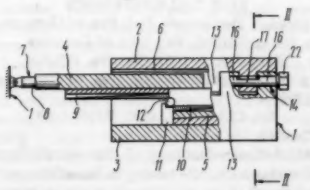
Vyacheslav I. Ermolovich; Valery A. Klushin; Vladimir I. Sadko, and Valery Y. Schukin, all of Minsk, U.S.S.R., assignors to Fiziko-Tekhnichesky Institut Akademii Nauk Belorusskoi SSR, Minsk, U.S.S.R.

PCT No. PCT/SU80/00149, 371 Date Apr. 20, 1982, 102(e) Date Apr. 20, 1982, PCT Pub. No. WO82/00608, PCT Pub. Date Mar. 4, 1982

PCT Filed Aug. 27, 1980, Ser. No. 375,035

Int. Cl.³ B21D 7/04

U.S. Cl. 72—90 **6 Claims**



1. A mill for cross rolling, said mill comprising: a detachable box-shaped housing having upper and lower portions, said upper and lower portions of said housing being releasably interconnected along contacting surfaces; projections and recesses provided along a line between said contacting surfaces of said upper and lower portions of said housing such that each of said upper and lower portions are provided with projections and recesses, said projections having coaxial through openings formed therein; rotary pins carried in said coaxial openings thereby interconnecting said upper portion to said lower portion, said rotary pins having cylindrical portions received in said openings formed in said projections of the lower part of said housing, said rotary pins having shaped portions being arranged in said openings formed in said projections of the upper portion of said housing, said shaped portions each having a cross-section that permits a contact arc between each shaped element and an inner portion of the opening of the projection to be defined by a central angle of less than 180°; parallel plates received in the housing, at least one of said plates being mounted on guides for reciprocation; wedge-shaped deforming tools mounted on opposite surfaces of said plates; and drive means connected with at least one of said plates.

4,455,855

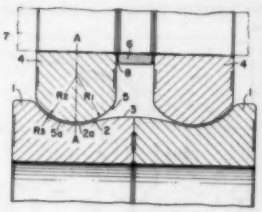
FORMING ROLLS OF PIPE-PRODUCING APPARATUS

Masayuki Hayashi, Toda, Japan, assignor to Kabushiki Kaisha Sanyo Seiki, Wako, Japan

Filed Jan. 25, 1982, Ser. No. 342,703

Int. Cl.³ B21D 5/12

U.S. Cl. 72—178 **2 Claims**



1. In a rolling mill for the manufacture of a welded metal tube of circular cross-section, wherein the opposite edge portions of a long strip are curled so that they abut tightly against each other before its welding operation, forming rolls comprising, in combination:

a lower roll, being mounted on a lower roll shaft and having an outer circumferential working surface which, as viewed in section taken along a plane passing through the rotational axis of the roll, has a smooth continuous profile in the shape of a reflexed, recurved bow, the axially outer parts thereof being two concavities of symmetrical configuration of a radius of curvature approximately equal to the radius of the tube to be produced and being joined together by a convex middle part; and

an upper roll having separate first and second roll parts of identical shape and dimensions supported at spaced-apart positions on a roll shaft, each roll part having a rounded outer circumferential working surface which, as viewed in section taken along a plane passing through the rotational axis of the upper roll, has a smooth profile of rounded convex shape with mutually different inner and outer radii of curvature on inner and outer sides of a centerline bisecting the profile and extending perpendicular to said rotational axis, the outer radii respectively of the first and second roll parts being equal and the inner radii respectively thereof being equal,

the outer portion of the working surface of the outer radius of each roll part being positioned to confront the working surface of a respective one of said concavities of the lower roll with a gap therebetween substantially equal to the wall thickness of the metal tube to be produced and to carry out a forming operation cooperatively therewith on a metal plate passed therebetween, said upper roll shaft

being positioned parallel to said lower roll shaft and with the convex middle part of the lower roll extending between the spacing of the spaced-apart separate first and second roll parts, so that the orientation of each roll part of the upper roll on the roll shaft is inverted to interchange the positions of the roll parts thereof of the inner and outer radii, thereby changing said gap to suit the wall thickness of the metal tube being produced,

whereby the forming rolls can curl edge portions of the metal plate without a springback.

4,455,856

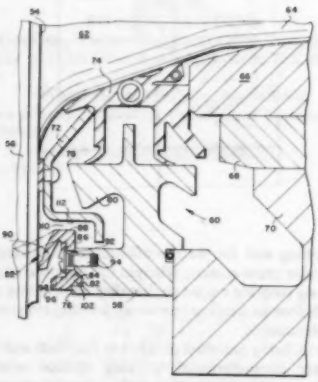
COOLANT SEAL FOR ROLLING MILL OIL FILM BEARING

Lowell S. Salter, Jr., Shrewsbury; Ralph F. Divirgilio, Holden, and Russell A. Brickey, Princeton, all of Mass., assignors to Morgan Construction Company, Worcester, Mass.

Filed Apr. 4, 1983, Ser. No. 481,753

Int. Cl.³ B21B *27/06*; F16J *15/54*

U.S. Cl. 72—236 **10 Claims**



1. In a rolling mill wherein the neck of a roll is provided with a sleeve which is rotatably supported in a bushing contained in a bearing chock, with a film of oil being maintained between the sleeve and bushing during operation of the mill, and with a seal assembly located between an end face of the roll and the bearing chock to prevent oil from escaping from the bearing chock while excluding contaminants such as cooling water, mill scale, etc. from entering the bearing chock, the said seal assembly including a circular seal end plate fixed relative to the bearing chock at a location surrounding a circular flexible flanged seal mounted on the roll neck for rotation therewith, said seal end plate having a circular mounting surface spaced axially from the roll end face, the improvement comprising: a circular coolant seal having a radially disposed mounting flange integrally joined at its inner edge to a sealing flange extending angularly and flexibly therefrom, attachment means for detachably securing said mounting flange to said mounting surface at a location placing said sealing flange in frictional contact with the roll end face, said mounting flange being provided with integral bumper means protruding axially therefrom towards the roll end face, said bumper means cooperating with said mounting flange to define a recess into which said sealing flange may be flexibly pressed by the roll end face in the event that said bumper means is engaged by said roll end face.

4,455,857

FORMING PRESS FOR BENDING A BLANK

Guido Salvagnini, Arzignano, Italy, assignor to Salvagnini Transferica S.p.A., Vicenza, Italy

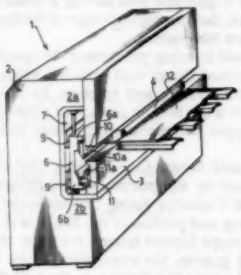
Division of Ser. No. 171,347, Jul. 23, 1980, Pat. No. 4,385,513. This application Sep. 27, 1982, Ser. No. 424,016

Claims priority, application Italy, Aug. 2, 1979, 24895 A/79

The portion of the term of this patent subsequent to Jan. 6, 1998, has been disclaimed.

Int. Cl.³ B21D *5/04*

U.S. Cl. 72—320 **3 Claims**



1. A press for bending a blank, said press comprising a base, a longitudinally extending counterblade connected with said base and defining a support plane for the blank, at least one longitudinally extending bending blade having an edge portion with a longitudinal axis extending parallel to a longitudinal axis of said counterblade, carrier means connected with said base for supporting said bending blade, said carrier means being movable with respect to said base in a first direction perpendicular to said support plane and said bending blade being movable with respect to said carrier means in a second direction parallel to said support plane, there being provided thrust means for holding said bending blade in a first position with respect to said carrier means, first drive means operable for initially moving said carrier means in a said first direction toward said counterblade to cause said bending blade to effect prebending of the blank, second drive means operable independently from the first ones for subsequently moving said bending blade in said second direction from said first position to a second position toward said counterblade to cause said bending blade to complete bending of the blank, and adjustable stop means for setting said first and second positions of the bending blade.

4,455,858

METHOD OF MANUFACTURING A HOLLOW NEEDLE FOR TAG FASTENERS

Heinz W. Hettic.., Furtwangen, Fed. Rep. of Germany, assignor to Firma Heinz Hettich, Fed. Rep. of Germany

Filed Jun. 5, 1981, Ser. No. 270,918

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3021799

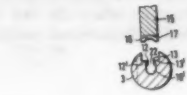
Int. Cl.³ B21D *53/00*; B21G *1/08*

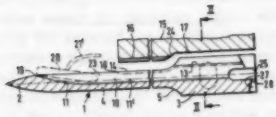
U.S. Cl. 72—324 **5 Claims**

1. A method of manufacturing a hollow needle from a round metal blank to form a needle having an inner front portion with a front end tapering to a point and a rear portion having a larger diameter than the front portion and forming a mounting shank, the needle having a longitudinal guide channel defined therein which is opened at the rear end of the rear mounting shank and tapers from a substantially uniform depth along a major portion of its length to a minimum depth adjacent the point, the channel being adapted to receive substantially cylindrical cross pins with an appended piece of filament which

forms a part of a fastener for tags, buttons and simular items to be attached to carrier material such as textiles, comprising:

forming in a single operation the channel to a depth of substantially half the diameter of the round metal blank using one miller cutter, said single operation also forming a shoulder portion on each side of the channel at least in the rear mounting shank which has an interior surface extending in the channel and an inclined surface extending outwardly of the top of the channel using the same miller cutter which miller cutter has a U-shape convex tooth and a side tooth portion on each side of the convex tooth and is shaped so that each side tooth portion is positioned with respect to the convex tooth for forming each shoulder portion with its inclined surface extending outside a diameter of the front portion of the needle; and





after forming the channel, pressing the shoulder portions using a stamping tool to inwardly close a portion of the top of the channel, the stamping tool shaped to have a pair of stamping faces with a transition zone therebetween adapted to engage the metal blank over a transition zone between the front portion and the mounting shank thereof, the stamping face of the stamping tool for engaging the shoulder portions in the mounting shank being offset in a direction away from the mounting shank with respect to the stamping face for engaging the front portion, thereby forming the channel in the rear mounting shank to have an oblong cross section with respect to the channel in the front portion.

4,455,859

APPARATUS FOR APPLYING PULLING FORCE TO VEHICLE BODY

Tatsuzo Yamada, 7-43, Morikitacho, 6-chome, Higashinada-ku, Kobe-shi, Hyogo-ken, Japan, assignor to Tatsuzo Yamada, Hyogo and Maeda Kiko Company Limited, Osaka, both of, Japan

Filed Mar. 29, 1982, Ser. No. 362,840
Int. Cl.³ B21D *1/12*
U.S. Cl. 72—447 **2 Claims**

1. An apparatus for applying plural independent pulling forces to a structure, said apparatus comprising:

a post member formed of a pair of spaced generally L-shaped side walls including respective vertical portions and respective horizontal portions extending forwardly from lower ends of said vertical portions, and a back wall joining said vertical portions;

said back wall having therein a plurality of vertically spaced supporting chain receiving apertures, each said aperture including a larger hole of a size to allow passage therethrough of a supporting chain and a smaller hole joining said larger hole and of a size to retain a supporting chain;

said vertical portions of said side walls having therein a plurality of vertically spaced shaft supporting apertures arranged in laterally aligned pairs;

a pair of wheels rotatably mounted laterally outwardly of respective said lower ends of said vertical portions of said side walls;

a swingable holding member formed of spaced side plates, and first and second vertically spaced holding brackets integral with and extending between said side plates, each said holding bracket having therein a plurality of upwardly facing towing chain holding notches;

a substantially rounded front wheel;

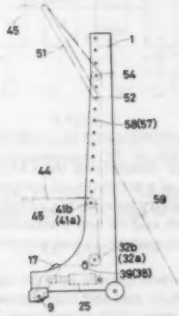
a first shaft rotatably supporting said front wheel between said side plates of said holding member and extending through apertures in lower ends of said side plates and apertures in forward ends of said horizontal portions of said side walls, said first shaft thereby pivotally mounting said holding member between said side walls;

a hydraulic cylinder unit having a first end mounted between said horizontal portions of said side walls and a second end pivotally connected to said holding member at a level above said first shaft, such that extension and contraction of said hydraulic cylinder unit pivots said holding member forwardly and rearwardly, respectively, about said first shaft;

a plurality, equal to said plurality of notches in said holding brackets, of first sprocket wheels, each said first sprocket wheel having coaxially fixed thereto a respective ratchet wheel;

a second shaft extending through a selected pair of said apertures in said vertical portions of said side walls and rotatably supporting said first sprocket wheels and respective said ratchet wheels at a level above said first shaft;

a plurality, equal to said plurality of first sprocket wheels, of second sprocket wheels rotatably mounted between said



vertical portions of said side walls at selectively changeable positions above the level of said second shaft;

a supporting chain retainable in a selected said aperture in said back wall and adapted to be connected to a floor;

a plurality of towing chains, each said towing chain being retainable adjacent a first end thereof in a respective said notch in a selected one of said first and second holding brackets, each said towing chain extending along an independent path in a first direction from the respective first end thereof to and passing around a respective said first sprocket wheel and then to and passing around a respective said second sprocket wheel and then forwardly, with a second end of each said towing chain adapted to be connected to a structure to which a force is to be applied;

whereby extension of said hydraulic cylinder unit will pivot said holding member forwardly about said first shaft, thereby pulling each said towing chain along an independent path in a second direction opposite to said first direction and causing each said towing chain to apply to the structure an independent pulling force; and

means for, upon contraction of said hydraulic cylinder unit and pivoting of said holding member rearwardly, preventing said towing chains from moving in directions opposite to respective said pulling directions thereof, said means comprising a plurality, equal to said plurality of ratchet wheels, of pawls, each said pawl being fixed to a first end of a respective third shaft rotatably supported in a said

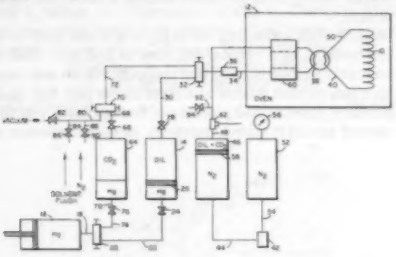
aperture in a respective said vertical portion of one of said side walls, and a plurality of weight means fixed to second ends of respective said third shafts for urging said third shafts to rotate in respective directions to urge said pawls into engagement with respective said ratchet wheels, thereby to enable rotation of said ratchet wheels and said first sprocket wheels in said pulling directions but to prevent rotation thereof in the reverse directions.

4,455,860

METHOD AND APPARATUS FOR DETERMINING CO_2 MINIMUM MISCIBILITY PRESSURE OF RESERVOIR OIL

Alvin S. Cullick, Dallas; Melwyn L. Mathis, Arlington, and Bert J. Warner, Dallas, all of Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 7, 1982, Ser. No. 447,595
Int. Cl.³ G01N *33/26*
U.S. Cl. 73—19 **19 Claims**



1. A method of determining the CO_2 minimum miscibility pressure (MMP) of a reservoir oil comprising:

(a) filling a capillary tube having a predetermined length and diameter with said oil and maintaining the oil at a predetermined temperature T_1 and pressure P_1 below the CO_2 MMP;

(b) injecting carbon dioxide into the capillary tube at a predetermined flow rate and temperature to displace said oil through said tube while maintaining the oil in the capillary tube at the predetermined temperature T_1 and pressure P_1 below the CO_2 MMP;

(c) constantly determining the pressure drop across the capillary tube and the total volume of carbon dioxide injected;

(d) plotting the pressure drop versus volume of carbon dioxide injected data and determining the pressure drop ΔP_1 at the inflection point of the plot at the point where the second derivative goes from a negative value to a positive value;

(e) repeating steps (a) thru (d) at a pressure P_2 below the CO_2 MMP to determine the pressure drop ΔP_2 at the inflection point defined in step (d);

(f) repeating steps (a) thru (d) at a pressure P_3 above the CO_2 MMP to determine the pressure drop ΔP_3 at the inflection point defined in step (d);

(g) repeating steps (a) thru (d) at a pressure P_4 above the CO_2 MMP to determine the pressure drop ΔP_4 at the inflection point defined in step (d);

(h) calculating the pressure drop ΔP_{CO_2} across the capillary tube for carbon dioxide at the test conditions for P_1, P_2, P_3 and P_4 in accordance with the following Hagen-Poiseuille equation:

$$\Delta P_{CO_2} = \frac{F_v(8)(\mu)(L)}{\pi\,(R^4)}$$

where

ΔP_{CO_2} = pressure drop across capillary tube;
Fv = volumetric flow rate;
μ = viscosity of CO_2 at test temperature and pressure;
L = capillary tube length;
R = capillary tube radius.

(i) subtracting the pressure drop for carbon dioxide corresponding to pressure P_1, P_2, P_3 and P_4 from the corresponding pressure drop ΔP_1, ΔP_2, ΔP_3 and ΔP_4 to obtain a resultant pressure drop $\Delta(\Delta P)_1$, $\Delta(\Delta P)_2$, $\Delta(\Delta P)_3$ and $\Delta(\Delta P)_4$;

(j) plotting $\Delta(\Delta P)_1$ and $\Delta(\Delta P)_2$ as a linear function of P_1 and P_2 for immiscible CO_2 displacement;

(k) plotting $\Delta(\Delta P)_3$ and $\Delta(\Delta P)_4$ as a linear function of P_3 and P_4 for miscible CO_2 displacement; and

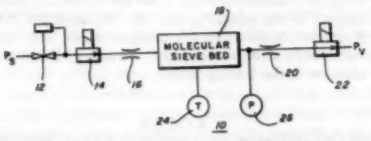
(l) determining the CO_2 MMP graphically by determining the pressure at the point where the two lines defining miscible and immiscible displacement intersect.

4,455,861

MOLECULAR SIEVE OXYGEN MONITOR

David N. Alftine, Bettendorf, Iowa, assignor to Litton Systems, Inc., Davenport, Iowa

Filed Jan. 24, 1983, Ser. No. 460,305
Int. Cl.³ G01N *31/06*
U.S. Cl. 73—23 **4 Claims**



1. A monitoring system for determining the concentration of oxygen in the product gas of an oxygen enriching system comprising:

a differential pressure regulator means for reducing the pressure of said product gas, and for regulating the pressure of said product gas at a preset level, and for referencing said regulated presssure to atmospheric pressure,

solenoid valves for allowing product gas to pressurize said monitoring system in a first condition and to allow product gas to vent the monitoring system to the atmosphere in a second condition,

restrictive orifices upstream and downstream of a bed of molecular sieve material to eliminate pressure spikes in said monitoring system,

a bed of molecular sieve material to adsorb oxygen from said product gas which

in a first condition, with the system pressurized, the upper pressure limit is attenuated as the molecular sieve bed adsorbs oxygen from the product gas, and

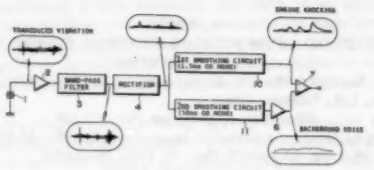
in a second condition, with the system vented to the atmosphere, the lower pressure limit is attenuated by the rate of desorption of the oxygen from the molecular sieve bed, and

a pressure transducer with means for converting the system pressure to an electrical analog of that pressure including means for comparing said electrical analog to a reference and inferring oxygen concentration.

4,455,862
METHOD AND APPARATUS OF DETECTING ENGINE KNOCKING

Kiyoshi Takeuchi, Yokosuka, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Apr. 22, 1982, Ser. No. 370,822
Claims priority, application Japan, Apr. 27, 1981, 56-63671
Int. Cl.³ G01L 23/22
U.S. Cl. 73—35 7 Claims



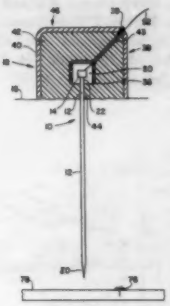
1. An engine knocking detection apparatus which comprises:
(a) a vibration sensor for detecting engine vibrations and transducing the detected engine vibrations into electrical engine vibration signals corresponding thereto:
(b) a band-pass filter connected to said vibration sensor for attenuating all but a selected range of the frequency components of the transduced engine vibration signals;
(c) a first smoothing circuit made up of a plurality of condensers and resistors and connected to said band-pass filter for smoothing the resulting engine vibration signals and outputting only the engine vibration signals having damping envelopes with the time constants greater than a lower limit;
(d) a second smoothing circuit made up of a plurality of condensers and resistors and connected to said band-pass filter in parallel with said first smoothing circuit for smoothing the engine vibration signals and outputting only the engine vibration signals having damping envelopes with time constants greater than an upper limit;
(e) a comparator, one input terminal of which is connected to said first smoothing circuit and the other input terminal of which is connected to said second smoothing circuit, for comparing the amplitude of the engine vibration signals outputted from said first smoothing circuit with the amplitude of the signals outputted from said second smoothing circuit and outputting engine knocking indication signals when the amplitude of the engine vibration signals outputted from said first smoothing circuit exceed that outputted from said second smoothing circuit,
whereby engine knocking vibrations with time constants between said lower limit and said upper limit are detected.

4,455,863
SONIC DETECTION OF GAS LEAKS IN UNDERGROUND PIPES

James E. Huebler, Brookfield, and Jeffrey M. Craig, Chicago, both of Ill., assignors to Consolidated Natural Gas Service Company, Cleveland, Ohio

Filed Mar. 29, 1982, Ser. No. 362,668
Int. Cl.³ G01M 3/24
U.S. Cl. 73—40.5 A 29 Claims

1. A sound detection device for locating gas leaks in underground pipelines comprising:
a sound transducer; and
an elongated probe having one end which is capable of being inserted in the ground for a substantial portion of the length of said probe, and an opposing end secured to said transducer above the ground;

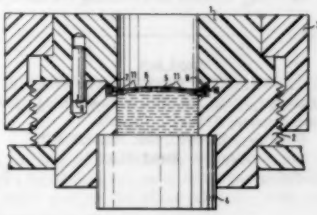


said probe and said sound transducer having a combined effective mechanical resonant frequency equal to or below the electrical resonant frequency of said transducer.

4,455,864
MEMBRANE OSMOMETER

Franz Wallner, Humboldstrasse 22, Berlin 33, Fed Rep. of Germany 1000

Filed Feb. 18, 1982, Ser. No. 349,834
Claims priority, application Fed. Rep. of Germany, Mar. 17, 1981, 3110183
Int. Cl.³ G01N 13/04
U.S. Cl. 73—64.3 15 Claims



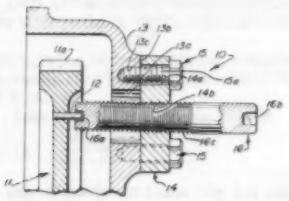
1. A membrane osmometer for direct measurement of osmotic pressures comprising a pressure measuring chamber for receiving pure solvent, a sample chamber separated therefrom for receiving solution to be tested, and a semi-permeable membrane contacting a support plate coarsely pervious to liquids, the membrane being located on the side of the support plate adjacent to the sample chamber, the improvement comprising, the sample chamber including, on its surface nearest the membrane, a conically tapered annular surface oriented so that the tip of a hypothetical cone which surface includes said conical annular surface, is on the side of the membrane opposite the sample chamber, said tapered annular surface, when the sample chamber and pressure measuring chamber are assembled, presses an elastic sealing ring against the surface of the membrane facing the sample chamber and against an inner surface of the pressure measuring chamber.

4,455,865

METHOD AND DEVICE FOR LOCATING A FIXED POINT OF REFERENCE RELATIVE TO A PREDETERMINED SEGMENT OF ROTARY MEMBER

Clair H. Davenport, Morgantown; Richard B. Combs, Columbus, and Dennis A. Wilber, Elizabethtown, all of Ind., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 31, 1981, Ser. No. 337,016
Int. Cl.³ G01M 15/00
U.S. Cl. 73—116 11 Claims



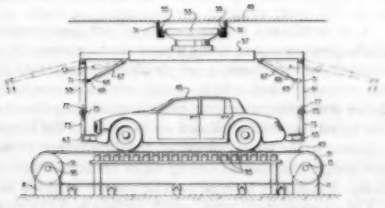
1. A device for locating a fixed point of reference relative to a predetermined segment of a rotary member when the latter is disposed in a selected position of rotary adjustment, said device comprising a bracket mounted for independent adjustment on a supporting surface provided with an access opening adjacent the path of travel of the predetermined segment; means for securing said bracket in a selected position of adjustment on said support; an elongated alignment element removably mounted on said bracket for insertion through the access opening and selective independent movement towards and away from the predetermined segment of the rotary member while the latter is in the selected position of rotary adjustment, said alignment element and said bracket being movable as a unit on said supporting surface to effect alignment of an end of the alignment element with respect to the predetermined segment; and an elongated detecting piece mounted on said bracket in substitution of said alignment element subsequent to said bracket having been fixedly secured to said supporting surface while the rotary member is disposed in said selected position of adjustment, said detecting piece having an end thereof adapted to be disposed proximate the predetermined segment of the rotary member and defining the fixed point of reference.

4,455,866

MOTOR VEHICLE TESTING APPARATUS

Robert H. Barrigar, Suite 700, The National Bldg., 130 Slater St., Ottawa, Ontario, K1P 6E2, Canada

Filed Sep. 22, 1982, Ser. No. 421,437
Int. Cl.³ G01M 15/00
U.S. Cl. 73—117 9 Claims



1. Apparatus for facilitating the observation or measurement of one or more selected dynamic characteristics of a motor vehicle, comprising:

endless movable road surface simulation means providing a simulated road surface for contacting simultaneously all of the wheels of the motor vehicle thereby to support the motor vehicle and to permit rotation of the wheels of the motor vehicle relative to the simulated road surface,

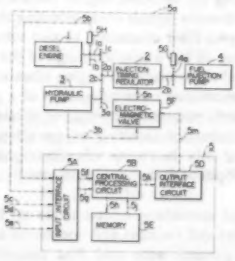
restraining means for removably engaging the motor vehicle and whilst in engaging with the motor vehicle restraining the motor vehicle from longitudinal movement, said restraining means being mounted for pivotal movement about a vertical axis and lateral movement relative to the road surface simulation means, thereby to permit steering of the motor vehicle relative to the simulated road surface.

4,455,867

METHOD OF DETECTING CONTROL ERROR IN DIGITAL CONTROL

Yuzo Koyanagi, Warabi, Japan, assignor to Sanwa Seiki Mfg. Co., Ltd., Saitama, Japan

Filed Nov. 3, 1981, Ser. No. 317,605
Claims priority, application Japan, Nov. 7, 1980, 55-155772; Nov. 26, 1980, 55-166201; Dec. 27, 1980, 55-189101
Int. Cl.³ G01M 15/00
U.S. Cl. 73—119 A 6 Claims



1. A method of detecting a control error in digital control according to claim 8, wherein said resultant controlled value comprises a relative rotational phase angle between an input shaft and an output shaft of a fuel injection timing regulator for an engine, said relative rotational phase angle being computed by the steps of detecting each angular position of said input shaft and output shaft by respective electromagnetic pickups, storing, in a computer, data on said angular positions detected by said electromagnetic pickups in the form of a time-series combination of pulses, and performing computation of said relative rotational phase angle on the basis of an interval of the combination of pulse signals.

4,455,868

METHOD FOR MOUNTING AT LEAST ONE SINGLE-CYLINDER PLUG-IN FUEL INJECTION PUMP ON A DIESEL INTERNAL COMBUSTION ENGINE

Günter Kampichler, Mühlacker, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 13, 1982, Ser. No. 417,738
Claims priority, application Fed. Rep. of Germany, Mar. 25, 1982, 3210988
Int. Cl.³ C01M 15/00
U.S. Cl. 73—119 A 14 Claims

1. A method for adjusting a plug-in fuel injection pump having a body portion provided with a supply quantity adjusting member located in a predetermined test position, comprising the steps of:

(a) inserting said injection pump into a bore in a test bench, corresponding to a pump fitting into which said injection pump is to be placed;

(b) introducing a coupling element associated with said supply quantity adjusting member into means cooperative with an adjusting rod in said test bench, said adjusting rod

being arranged to correspond to an engine governor rod in an engine in which said injection pump is to be placed;

(c) simultaneously shifting said adjusting rod and said coupling element into a test position corresponding to full load of the injection pump;

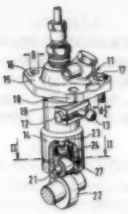
(d) driving said fuel injection pump at a fixed test rpm to measure a fuel supply quantity;

(e) rotating said injection pump relative to said bore in said test bench until said fuel supply quantity corresponds to a set point quantity;

(f) producing a first reference indication of an adjusted rotary position of the injection pump on the body portion of the pump relative to said test bench;

(g) locking the engine governor rod of an engine in which said injection pump is to be placed into a basic test position;

(h) inserting a dummy pump having a positionally fixed coupling member corresponding to the coupling element of said injection pump into a pump fitting of the engine in



which said injection pump is to be placed so as to engage a mating element of the engine goveror rod;

(i) applying a second positional alignment reference indication on the pump fitting and thereafter removing the dummy pump from the pump fitting;

(j) setting the pre-stroke of the injection pump in a known manner;

(k) removing said injection pump from the test pedestal and inserting said injection pump into the pump fitting of the engine so that said supply quantity adjusting member engages the mating element of said governor rod;

(l) rotating the injection pump in the pump fitting so that said first and second positional adjustment markings are aligned;

(m) securing said injection pump to the pump fitting;

(n) adjusting a limiting stop for the engine governor rod to a full load position corresponding substantially to its test position; and

(o) unlocking the engine governor rod.

4,455,869

METHOD FOR DETERMINING BOREHOLE OR CAVITY CONFIGURATION THROUGH INERT GAS INTERFACE

Paul P. Broussard, Rte. 1, Box 294-D, Lafayette, La. 70805; Donald Faul, Box N83A, Sunset, La. 70584, and Donald W. Granger, Rte. 11, Box 832, Lake Charles, La. 70601

Filed Jun. 21, 1982, Ser. No. 390,321

Int. Cl.³ E21B *47/08*

U.S. Cl. 73—151 **21 Claims**

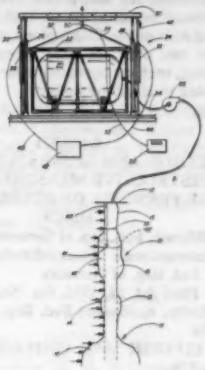
1. A method of determining the configuration of a borehole or cavity, which comprises the following steps:

a. providing a relatively inert fluid;

b. measuring the total weight of said fluid;

c. introducing said fluid under a known pressure and temperature into the borehole or cavity to be measured;

d. monitoring the weight loss of said measured fluid between certain measured intervals within said cavity; and



e. determining the area occupied by said fluid within at least one of said intervals as a function of said weight loss within said interval.

4,455,870

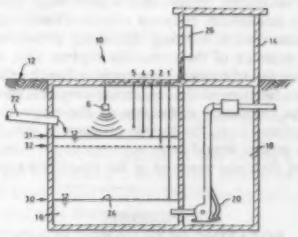
METHOD AND APPARATUS FOR DETERMINING LIQUID FLOW RATES

Johannes N. Jorritsma, 37 Yonge St., Aurora, Ontario, Canada

Continuation-in-part of Ser. No. 152,796, May 23, 1980, abandoned. This application Jun. 28, 1982, Ser. No. 393,038

Int. Cl.³ G01F *3/38*

U.S. Cl. 73—223 **13 Claims**



1. A method of determining the total inflow of a liquid through a liquid-flow system in which the liquid enters a sump cavity and is pumped out of the sump cavity by pump means, comprising the steps:

(a) allowing the liquid surface to rise between a predetermined lower limit level and a predetermined upper limit level while the pump means is shut off,

(b) detecting the arrival of the liquid surface at the upper limit level, and signalling the pump means to begin upon such arrival,

(c) pumping the liquid out of the sump cavity at a rate faster than the inflow rate, whereby the liquid surface falls between said upper limit level and said lower limit level,

(d) detecting the arrival of the liquid surface at the lower limit level, and turning off the pump at such lastmentioned arrival,

(e) again allowing the liquid surface to rise as in step (a) and repeating steps (b), (c) and (d) in sequence;

(f) calculating an on-going total inflow volume for the liquid by

(1) adding in the sump cavity volume between the lower

and upper limit levels each time the liquid surface rises to the upper limit level, and

(2) determining the inflow rate over a part of the filling time described in (a) above, said part being during the second half of the filling phase, and extrapolating this inflow rate over the time when the pump means is pumping, such extrapolated value being added in to the on-going total inflow volume.

4,455,871

METHOD AND APPARATUS FOR THE NON-DESTRUCTIVE MEASUREMENT OF THE RESPONSE PRESSURE OF REVERSIBLE RUPTURE DISCS

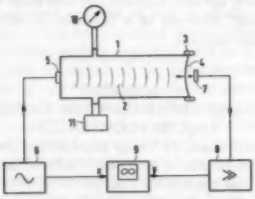
Peter Vogt, Rösrath, Fed. Rep. of Germany, assignor to INTERATOM Internationale Atomreaktorbau GmbH, Bergisch-Gladbach, Fed. Rep. of Germany

Filed Jul. 21, 1982, Ser. No. 400,589

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1981, 3129998

Int. Cl.³ G01H *13/00*; G01N *3/36*; G01L *9/00*

U.S. Cl. 73—579 **16 Claims**



1. Method of non-destructively determining response pressure of a reversible rupture disc which comprises: measuring resonance frequencies of lower vibration modes of the reversible rupture disc at varying measuring pressures below the response pressure of the reversible rupture disc; and extrapolating from the resonance frequencies of each of the vibration modes as a function of the measuring pressure, that pressure at which the resonance frequency of the respective vibration mode becomes zero, the lowest pressure at which one of the vibration modes would have zero resonance frequency being the lowest response pressure of the reversible rupture disc.

4,455,872

ROTATING ULTRASONIC SCANNER

George Kossoff, Northbridge, and Jack Jellins, Rose Bay, both of Australia, assignors to Commonwealth of Australia, The Department of Health, Phillip, Australia

Continuation of Ser. No. 193,974, Oct. 6, 1980, abandoned, which is a continuation of Ser. No. 16,513, Mar. 1, 1979, abandoned. This application Apr. 25, 1983, Ser. No. 480,830

Claims priority, application Australia, Mar. 3, 1978, PD3579

Int. Cl.³ G01N *29/04*

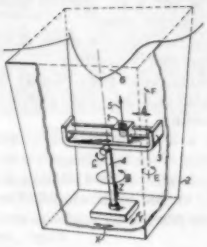
U.S. Cl. 73—618 **10 Claims**

1. Apparatus for obtaining a series of sectional ultrasonic scans of an object, said scans extending radially from a substantially central reference point on the object and being angularly displaced relative to each other, said apparatus comprising:

(a) a transducer for transmitting pulses of ultrasonic energy into said object in a predetermined direction relative to said transducer and for receiving echoes of said pulses of energy that are reflected by acoustic impedance discontinuities within said object;

(b) means for changing the spatial location of the pulses of ultrasonic energy along a linear path relative to said reference point, to thereby establish a plurality of beams along which said pulses are transmitted; and

(c) means for sweeping said linear path about an axis passing through the central reference point and center or one end of said linear scan, at a rate which is substantially slower



than the rate of changing the spatial location of said pulses along the linear path.

4,455,873

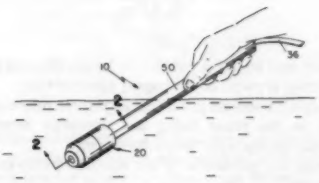
ULTRASONIC PROBE

Leigh R. Abts, Barrington, R.I., assignor to Micro Pure Systems, Inc., Smithfield, R.I.

Filed Dec. 4, 1981, Ser. No. 327,455

Int. Cl.³ G01N *29/00*

U.S. Cl. 73—629 **5 Claims**



1. A hand-held probe for obtaining information about the kind and number of small particulates in a large volume of fluid standing or slowly circulating in a container comprising:

an ultrasonic transmitter-receiver having a solid concave lens,

said transmitter-receiver being disposed in a protective sheath to shield the transmitter-receiver from the fluid, said sheath being positioned on the end of a rod whereby said probe can be directed by hand to various locations in the fluid including the corners of the container so that said transmitter-receiver can direct its ultrasonic energy through said concave lens and into the adjacent fluid and thereby detect the presence of the small particulates by detecting the energy reflected from them.

4,455,874

DIGITAL PRESSURE TRANSDUCER

Jerome M. Paros, King, Wash., assignor to Paroscientific, Inc., Redmond, Wash.

Filed Dec. 28, 1981, Ser. No. 334,649

Int. Cl.³ G01L *11/00*

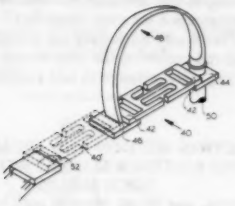
U.S. Cl. 73—704 **25 Claims**

1. A transducer for providing an electrical signal having a frequency indicative of a differential fluid pressure, comprising:

a resilient, elongated pressure vessel having at least one closed end, said pressure vessel having an interior and an exterior between which said differential pressure is applied, said pressure vessel having a nonsymmetrical con-

figuration so that it bends responsive to variations in said differential pressure; and

a force-sensitive crystal resonator generating said electrical signal, said resonator having at least one resonant element connected between a pair of mounts, said resonant element having sufficient compressional stiffness that its resonant frequency is dependent on the elastic properties



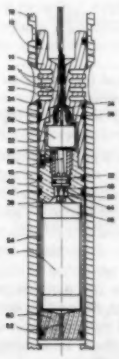
of said resonant element and the compression or tension applied to said resonant element so that the frequency of said electrical signal is a function of the force applied to said resonator through said mounts, said mounts being coupled to said pressure vessel so that the force applied to said resonant element varies in accordance with said differential pressure.

4,455,875

PRESSURE MEASUREMENT SONDE

André Guimard, and Jacques Lemarchand, both of Vaux-le-Pénil, France, assignors to Schlumberger Technology Corporation, New York, N.Y.

Filed Dec. 22, 1981, Ser. No. 333,494
Claims priority, application France, Dec. 24, 1980, 80 27734
Int. Cl.³ G01L *19/04;* E21B *47/06*
U.S. Cl. 73—708 **10 Claims**



1. Apparatus, including temperature compensation, for measuring the pressure of a surrounding fluid, comprising:

a housing having an opening and being adapted for immersion in said surrounding fluid;

a pressure measurement detector mounted within said housing and sensitive to pressure and temperature;

means for establishing communication between said pressure of said surrounding fluid and said pressure measurement detector;

a reference detector mounted within said housing and sensitive to temperature;

means for isolating said reference detector from communication with said pressure of said surrounding fluid; and

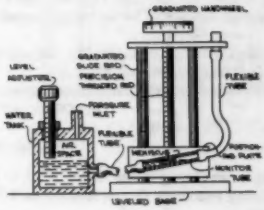
means for favoring the heat exchanges of said detectors with said surrounding fluid and for substantially balancing the heat exchange rates of each of said detectors with said surrounding fluid, including a heatsink having a recess therein and mounted within said housing to be contacted by said surrounding fluid through said housing opening, said reference detector being contained in said recess.

4,455,876

PRECISION MANOMETER GAUGE

Malcolm J. McPherson, Lafayette, and Robert A. Bellman, Berkeley, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Sep. 27, 1982, Ser. No. 425,144
Int. Cl.³ G01L *7/18*
U.S. Cl. 73—747 **8 Claims**



1. An apparatus for measuring positive pressures comprising:

a movable mounted positioning plate adapted to be moved along at least one graduated vertical member,

means for moving said positioning plate along a vertical path, said moving means including a graduated handwheel,

a closed reservoir adapted to contain a liquid and having means thereon through which a pressure to be measured is directed thereinto,

means for changing the displacement of liquid in said reservoir, and

a flexible tube operatively connected to said reservoir at one end for receiving liquid from said reservoir and being open at an opposite end, said flexible tube having a section thereof fixedly secured to said positioning plate at an angle from the horizontal, said section of tube having a marking thereon and constituting a monitoring section for indicating liquid level in said flexible tube when liquid is directed through said tube from said reservoir.

4,455,877

VORTEX SHEDDING MASS AIR FLOW SENSOR WITH STABILIZED FLUID FLOW

Chester J. Blechinger, Bloomfield Hills, and Louis R. Focht, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Sep. 30, 1982, Ser. No. 429,575
Int. Cl.³ G01F *1/32*
U.S. Cl. 73—861.22 **6 Claims**

1. A device for measuring the velocity of a fluid comprising:

vortex generating means positioned in a fluid stream so that vortices are formed in the wake of said generating means;

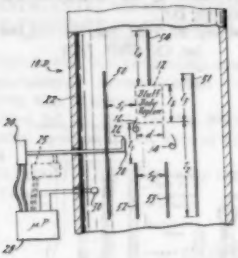
a first pair of spaced parallel plates positioned on either side of said vortex generating means, said plates being aligned with the direction of fluid flow and having a portion positioned downstream of the longitudinal position of said vortex generating means for improving vortex detection by increasing a signal to noise ratio, said first pair of plates both extending from a first longitudinal position to a second longitudinal position downstream of said first longitudinal position; and

a second pair of spaced parallel plates positioned downstream of said vortex generating means.

5. A device for measuring the velocity of a fluid comprising:

vortex generating means positioned in a fluid stream so that vortices are formed in the wake of said generating means, said vortex generating means being generally elongated and extending perpendicular to the direction of fluid flow so as to generate Karman vortices;

a splitter plate extending upstream from said vortex generating means, the ratio of the longitudinal extent of said splitter plate to the longitudinal extent of said vortex



generating means being in the range of 0.1 to 1, said splitter plate being relatively thin in relation to its longitudinal extent; and

a downstream pair of spaced parallel plates positioned generally in the stream of vortices from said vortex generating means, the ratio of the distance downstream of the leading edges of said downstream pair from the trailing edge of said vortex generating means to the width, d, of said vortex generating means at the widest portion in a direction perpendicular to fluid flow being in the range of 0.8 to 2, and the ratio of the separation between said downstream pair to d being in the range of 0.9 to 1.3.

4,455,878

FLUID FLOW RATE MEASURING APPARATUS

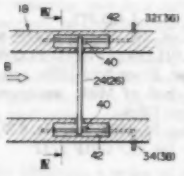
Toru Kita, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 12, 1982, Ser. No. 433,858

Claims priority, application Japan, Dec. 17, 1981, 56-187056[U]

Int. Cl.³ G01F *1/32, 1/68*

U.S. Cl. 73—861.22 **9 Claims**



1. A fluid flow rate measuring apparatus, comprising:

a conduit in which a fluid to be measured flows in a given direction;

a vortex generator arranged in said conduit to produce vortexes upon flowing of the fluid;

two terminal rod members of electrically conductive resilient material, each being fixed to laterally opposed side wall sections of said conduit downstream of said vortex generator, each terminal rod member having a straight section which extends along the conduit;

a vortex detector for detecting the vortexes produced by said vortex generator, said detector being supported by said terminal rod members by having both ends thereof electrically and mechanically connected to the straight sections of the terminal rod members, respectively;

two connecting wires, each having one end connected to the detector and the other end connected to the straight section of one of said terminal rod members to achieve an additional electrical connection between the detector and the corresponding terminal rod member in addition to the direct connection between them; and

means for resiliently supporting the straight sections of said terminal rod members, the ends of said detector and said connecting wires relative to said conduit.

4,455,879

INSPECTION METHOD AND APPARATUS FOR INSPECTING FASTENER SLIDERS WITH AUTOMATIC LOCK MEANS

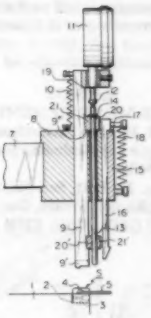
Tsutomu Hakoi, and Shinji Murata, both of Toyama, Japan, assignors to Yoshida Kogyo K. K., Tokyo, Japan

Filed Nov. 25, 1981, Ser. No. 324,817

Claims priority, application Japan, Dec. 20, 1980, 55-179688

Int. Cl.³ G01L *5/00*

U.S. Cl. 73—862.01 **7 Claims**



1. An inspection method for a fastener slider provided with automatic lock means having a resilient engaging construction in which, at the final step in assembly operation of said slider, said slider is positioned with the undersurface of the slider body held horizontal and a pull tab of the slider contacting the upper surface of said body and extending outwardly from said body horizontally, a downwardly biasing force is applied to said pull tab by a constant stroke of an operating rod means connected to a force sensing dial gauge from above and the quality of said slider is determined by electrical detection signals generated by the operation of electrical contacts establishing a value range on the dial gauge and activated by a pointer on said dial gauge, depending upon whether or not the resilient repulsion of said pull tab due to said resilient engaging construction of the automatic lock means is within the value range set by said electrical contacts.

4. An inspection apparatus for a fastener slider provided with automatic lock means having a resilient engaging construction comprising an intermittent transfer member adapted to hold said slider with the undersurface of the slider body extending horizontally and a pull tab associated with the slider contacting the upper surface of said slider body and extending horizontally, a force sensing dial gauge supported on a reciprocal mechanism which moves upwardly and downwardly by a constant stroke toward and away from the upper surface of said pull tab while said intermittent transfer member rests, an operating rod means extending downwardly from said dial gauge for engagement with the upper surface of said pull tab, and a detection mechanism having a electrical signal circuit with electrical contacts disposed at the extremes of a predeter-

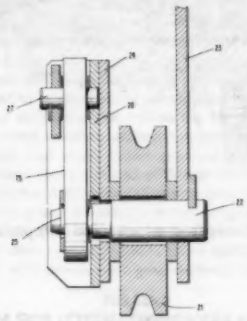
mined rotation range of a pointer of said dial gauge for detecting the resilient repulsion of said pull tab due to said resilient engaging construction of the automatic lock means.

4,455,880

ELECTRONIC TRANSMITTER ELEMENT AND A LIFTING DEVICE COMPRISING SUCH ELEMENT

Leif Näslund, Karlstad, Sweden, assignor to Handelsbolaget Örnell-Teknik, Sweden

Filed Mar. 23, 1982, Ser. No. 360,919
Int. Cl.³ G01L *5/00*
U.S. Cl. 73—862.56 **2 Claims**



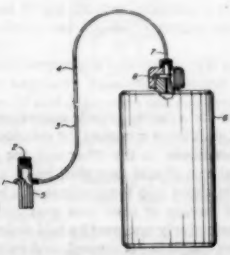
1. A lifting device comprising at least one pulley wheel which is supported by a frame portion in which the pulley shaft is pivotally supported, an electronic transmitter element being connected to the pulley shaft in order to generate a signal corresponding to the load acting on said shaft, characterized in that one end of the pulley shaft is pivotally supported in the frame portion, whereas its opposite end is pivotally supported in the electronic transmitter element, said element comprising a tensile link which is provided with strain gauges, one end of said link being pivotally connected to the frame portion whereas the opposite end is supporting the pulley shaft.

4,455,881

AEROSOL EXPOSURE MONITORING DEVICE

Reginald H. Clark, Kingston, and Joel R. Nodelman, Edmonton, both of Canada, assignors to Queen's University at Kingston, Kingston, Canada

Filed Jun. 21, 1982, Ser. No. 390,755
Claims priority, application Canada, Jul. 7, 1981, 381255
Int. Cl.³ G01N *1/24*
U.S. Cl. 73—863.21 **9 Claims**



1. A device for sampling respirable aerosols contained in an atmosphere, comprising:

a selector capillary tube open at one end thereof to said atmosphere;

a sampling capillary tube in fluid communication with the other end of said selector tube; and

aspiration means, connected in series fluid communication with said sampling tube, so as to draw said atmosphere through said selector and sampling tubes at a selected aspiration rate;

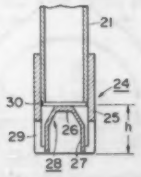
said selector tube having a length and internal diameter selected so as to precipitate therein non-respirable aerosols in said atmosphere at said aspiration rate; and said sampling tube having a length and internal diameter which are longer and smaller respectively so as to selectively precipitate therein substantially all respirable aerosols in said atmosphere at said selected aspiration rate.

4,455,882

DEVICE FOR MEASURING A WHOLE DAY URINARY OUTPUT

Yoshihiko Torii, Tokyo, and Osamu Tochikubo, Yokohama, both of Japan, assignors to Kabushiki Kaisha Vine, Tokyo, Japan

Division of Ser. No. 317,387, Nov. 2, 1981. This application Feb. 3, 1983, Ser. No. 463,552
Claims priority, application Japan, Nov. 13, 1980, 55-158868; Oct. 15, 1981, 56-163394
Int. Cl.³ G01N *1/12*
U.S. Cl. 73—864.65 **3 Claims**



1. A device for measuring a whole day urinary output comprising an outer cylindrical container and an inner hollow tubular container to be positioned in said outer cylindrical container for sampling urine from the outer cylindrical container characterized in that said inner hollow tubular container is a portable sampling tube used in combination with packing plug to be attached to at least one of the two open ends of the sampling tube, said packing plug comprises a hollow cylindrical portion and a plug body having a frustoconical head disposed in and formed integrally with said hollow cylindrical portion by means of a cylindrical portion underlying said head, the inside diameter of said hollow cylindrical portion is substantially equal to the outside diameter of said urine sampling tube and the outside diameter of the cylindrical portion underlying said head is substantially equal to the inside diameter of the urine sampling tube, and at least one opening for taking-in urine therethrough is provided in the side surface of the hollow cylindrical portion, and the sample tube has a substantially constant cross-sectional area ratio with respect to the outer cylindrical container at any vertical location thereof.

4,455,883

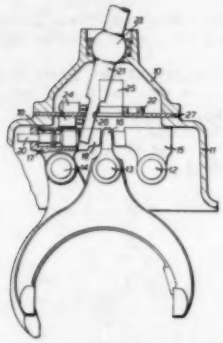
COMBINED SHIFT CONTROL

Thomas R. Radcliffe, Atherton, England, assignor to Eaton Corporation, Cleveland, Ohio

Filed May 29, 1981, Ser. No. 268,413
Claims priority, application United Kingdom, Nov. 14, 1980, 8036599
Int. Cl.³ G05G *9/14, 5/10*
U.S. Cl. 74—475 **8 Claims**

1. A combined shift control for a motor vehicle driveline comprising a change speed gear transmission connected in series with a two speed axle, said control comprising a gear

transmission casing, at least two parallel shift rods each shiftable axially in the casing to select a gear ratio or gear ratios of the transmission, a selector finger pivotably mounted with respect to said casing, switch means mounted in the casing adapted to change the axle ratio between high and low values, wherein each shift rod carries a respective selector block having engagement faces engageable by the selector finger to axially shift the shift rods, wherein one selector block only is such that the selector finger can occupy a first or a second operational position with respect thereto, said first and second positions being adjacent without any operational position for engagement of the other selector block engagement faces interposed therebetween, movement of the selector finger between the two operational positions effective to control the switch means to change the axle ratio whereby the number of



driveline gear ratios effectively selectable by the one selector block is increased by one or two, a spring-loaded plunger arranged in the one selection block for movement transverse to the shift rod axis to be overcome for movement of the selector finger between the first and second operational positions and means to retain the selector finger in the second operational position against the force of the spring-loaded plunger when the second position is selected, said means to retain comprising a gate plate adapted to slide in the casing with the selector finger upon movement thereof when the axle ratio is that associated with the first operational position, and arranged to be locked in position in the casing when the selector finger is in the second operational position whereby the selector finger is retained beween the spring-loaded plunger and a respective axially extending face of the gate plate.

4,455,884

CHANGE SPEED TRANSMISSION FOR MOTORCYCLES

Kiyofumi Tsuruta; Yoshimi Osanai, both of Saitama, and Takanori Onda, Kanagawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

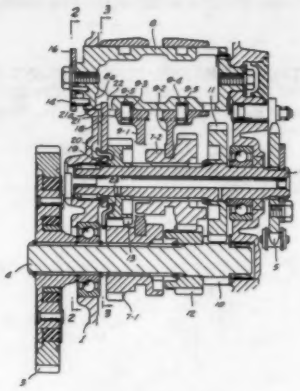
Filed Feb. 8, 1982, Ser. No. 346,895

Claims priority, application Japan, Feb. 18, 1981, 56-21375

Int. Cl.³ F16H *57/06*

U.S. Cl. 74—477 **8 Claims**

1. In a change speed transmission device having an input shaft, an output shaft, and means including gear means for driving the output shaft from the input shaft at any one of a plurality of speed ratios, the improvement comprising, in combination: a shift drum mounted parallel to the shafts and provided with an abutment, means for turning said shift drum, means operated by turning movement of shift drum to select a desired speed ratio between the shafts, a pivoted pawl engageable with said abutment to limit turning movement of said shift drum, a member fixed to rotate with one of the shafts, means frictionally engaging said member for biasing said pawl to engage said abutment, whereby said shift drum is prevented



from turning directly from a high speed shift position to a low speed shift position.

4,455,885

ROTATION REVERSING SWITCH FOR MOTOR VEHICLE GEAR UNITS

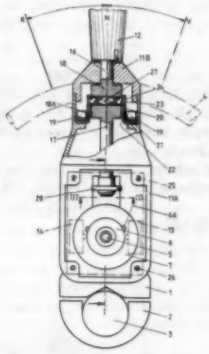
Willy Beig, Friedrichshafen, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 16, 1982, Ser. No. 358,625

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 8111524[U]

Int. Cl.³ G05G *5/10*; **H01H** *9/06, 9/22*

U.S. Cl. 74—477 **4 Claims**



1. A gear selector for a motor vehicle comprising:

a support; a gear shift lever mounted for rotation about two axes, one perpendicular to the other and one of which is the longitudinal axis of said gear shift lever; a drum controller rotatable about said longitudinal axis by said gear shift lever and having at least two gear ratio switches adapted to be selectively operated by said drum controller when said drum controller is rotated, said micro switches each determining a gear position of said motor vehicle to give a pre-determined gear ratio; a pivot defining the second of said axes and being ...fixed to said support; a forward-reverse selecting means supported by said pivot and rotatable thereabout by said gearshift lever, said for-

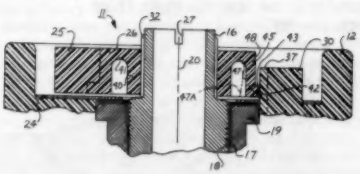
ward-reverse selecting means having (i) a casing with a cam, said casing having an inner wall and being rigidly fixed to said pivot, (ii) a cylinder within said casing rotatable by said gear shift lever about said pivot, (iii) a first position arresting means arresting the positions of said casing relative to said cylinder in pre-determined positions corresponding to forward, neutral and reverse of said motor vehicle and (iv) two forward-reverse switches corresponding to the forward and reverse positions adapted to be alternately activated by said cam and rotatable in unison with said cylinder about pivot by said gear shift lever; and a locking means having (i) a locking disc rotatable about said longitudinal axis by said gear shift lever, its circumference having a larger radius portion and a smaller radius portion, the position of said large radius portion being determined by the position of said gear shift lever that selects the lower gear ratios and position of the small radius portion being determined by the position of said gear shift lever that selects the higher gear ratio and (ii) a second position arresting means operating against said large and small radius portions and preventing in conjunction therewith and with said casing the operating of said forward-reversing selecting means when said gear shift lever is in a position wherein a higher gear ratio has been selected but permitting the operating of said forward-reverse selecting means when said gear shift is in a position wherein a lower gear ratio has been selected.

4,455,886

ADJUSTABLE THERMOSTAT

Donald J. Schmitt, Mansfield, Ohio, assignor to Therm-O-Disc, Incorporated, Mansfield, Ohio

Filed Nov. 16, 1981, Ser. No. 321,399
Int. Cl.³ G05G 5/06
U.S. Cl. 74—531 **12 Claims**



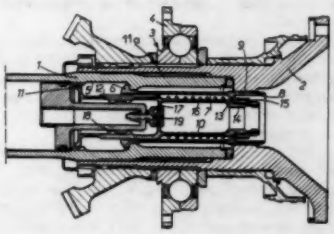
1. An adjustable thermostat comprising, in combination:
a base;
a shaft mounted for rotation relative to said base about an axis to adjust an operating temperature of the thermostat;
detent means including first and second coacting detent members acting between said shaft and said base upon rotation of said shaft;
said second detent member including a portion extending in an arc about said axis and coacting with said first detent member;
a first radial depression relative to said axis on said arcuate portion angularly adjacent a second radial projection, with one of said depression and projection defining at least one detent position of said shaft;
spring means between said arcuate portion and one of said shaft and base;
said spring means including a first arcuate wall extending generally in an arc about said axis and integral with said arcuate portion;
said first arcuate wall being defined by inner and outer surfaces extending generally in arcs about said axis;
anchor means connected to mount said spring means on one of said shaft and base;
said spring means including a radially extending wall integral with said first arcuate wall;
said anchor means including a second arcuate wall connected to said radially extending wall for a U-shaped cross section of said radially extending wall and arcuate walls; and
said spring means being stressable as said shaft is turned from said at least one detent position to have said arcuate portion cammed radially by engagement with said first detent member to thus deform said first arcuate wall and said inner and outer arcuate surfaces.

4,455,887

DEVICE TO CORRECT AN UNBALANCE OF THE ROTOR OF TURBINE ENGINES

Pierre J. Lissajoux, Saint Michel sur Orge, and Marcel L. Rigo, Paray Vieille Poste, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, France

Filed Feb. 10, 1982, Ser. No. 347,543
Claims priority, application France, Feb. 11, 1981, 81 02632
Int. Cl.³ F16F 15/22, 15/32
U.S. Cl. 74—573 R **8 Claims**

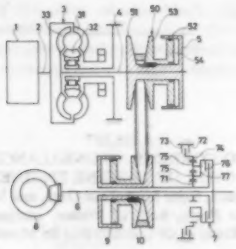


1. A device to correct the imbalance of a rotor in a turbojet engine wherein the rotor is mounted on a shaft having two segments joined so as to rotate together, the shaft segments defining coaxially aligned bores, a portion of a first shaft segment having a plurality of flutes extending into the bore and a portion of a second shaft segment defining internal threads, the device comprising: (a) a packing ring member disposed in the coaxially aligned bores, the packing ring defining a bore therethrough and engaging the first and second shaft segments so as to retain them in assembled relationship; (b) a blocking piece disposed within the bore in the packing ring and attached to the packing ring, the blocking piece and the packing ring having interengaging flutes to prevent relative rotation between them, the blocking piece defining a bore therethrough with a transverse wall extending across the bore and flutes extending along at least a portion of the bore; (c) a balancing piece having (i) a cylindrical body with flutes along at least a portion of its outer surface, the cylindrical body being disposed with the bore of the blocking piece such that its flutes engage those flutes on the bore of the blocking piece, (ii) a cylindrical part attached to the cylindrical body, the cylindrical part and the cylindrical body being disposed coaxially with bores in the first and second shaft segments, and (iii) an eccentric part attached to the cylindrical part; and, (d) fastening means to attach the cylindrical body of the balancing piece to the transverse wall of the blocking piece such that the circumferential position of the eccentric part may be oriented and fixed in position to offset any imbalance in the rotor and shaft structure.

4,455,888
AUTOMOTIVE TRANSMISSION

Robert W. Wayman; Mutsumi Kawamoto, both of Nagoya, and Shiro Sakakibara, Anjo, all of Japan, assignors to Aisin-Warner K.K., Anjo, Japan

Filed Oct. 30, 1980, Ser. No. 202,154
Claims priority, application Japan, Oct. 30, 1979, 54-141032
Int. Cl.³ F16H 37/00, 37/08
U.S. Cl. 74—689 3 Claims



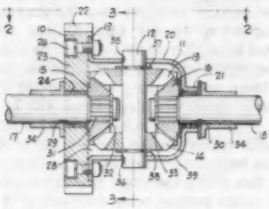
1. A variable transmission for automotive vehicles comprising:
(a) an input shaft to be driven by an engine;
(b) a hydraulic power transmission;
(c) an output shaft to drive wheels, arranged parallel to said input shaft;
(d) a reduction gear mechanism provided coaxially with said output shaft, said reduction gear mechaism comprising a planetary gear mechanism wherein a sun gear is arranged at an input side of said mechanism, a carrier is arranged on the input side of a differential gear mechanism, and a ring gear, is always fixed;
(e) a differential gear mechanism connected with said output shaft, comprising a planetary gear mechanism wherein a ring gear is connected to the carrier of said reduction gear mechanism, a carrier of said differential gear mechanism is connected with said output shaft, and a sun gear is connected to a second output shaft;
(f) a V-belt stepless drive ratio shifting means comprising a drive pulley provided coaxially with said input shaft and a driven pulley provided coaxially with said output shaft, said drive pulley and said driven pulley being connected by a belt;
(g) a planetary gear mechanism operating as a reverse shifting means, comprising a sun gear, a carrier, a ring gear, and a double pinion;
(h) a brake to act selectively on said ring gear of said planetary gear mechanism which operates as a reverse shifting means, and
(i) a clutch selectively engageable for connecting an output side with an input side of said planetary gear mechanism which operates as a reverse shifting means.

4,455,889
FREE FLOATING PINION SHAFT

Hans Hauser, Chippewa Lake, Ohio, assignor to MTD Products Inc., Cleveland, Ohio

Filed Oct. 8, 1981, Ser. No. 310,485
Int. Cl.³ F16H 1/40, 1/38
U.S. Cl. 74—713 4 Claims

1. In a differential with a housing with sidewalls having a pair of axially aligned pinion shaft support holes therein and with a pinion shaft extending longitudinally between the holes, the pinion shaft having a pair of pinion gears freely journaled thereon, the improvement of a pinion mounting comprising a pair of retention pieces mounted on said shaft within said housing and spaced from the sidewalls thereof, a first of said pair of retention pieces being mounted on the pinion shaft on the outer side of a first of the pair of pinion gears, said first pinion gear being in direct bearing engagement with said first retention piece, a second of said pair of retention pieces being mounted on the pinion shaft on the outer side of a second of the pair of pinion gears, said second pinion gear being in direct

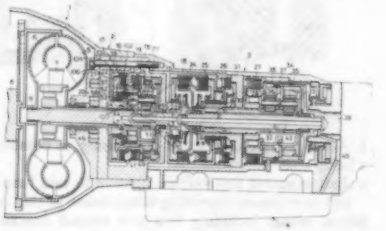


bearing engagement with said second retention piece, the pinion shaft being longitudinally free floating in respect to the sidewalls of the housing and said pair of retention pieces within the housing acting to prevent the disengagement of the pinion shaft through a said hole from the housing.

4,455,890
OVERDRIVE DEVICE FOR AUTOMATIC TRANSMISSIONS

Koujiro Kuramochi; Kazuaki Watanabe, and Yukio Terakura, all of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Aichiken, Japan

Continuation-in-part of Ser. No. 133,826, Mar. 25, 1980, abandoned, which is a continuation of Ser. No. 818,852, Jul. 25, 1977, abandoned. This application Sep. 22, 1980, Ser. No. 189,359
Claims priority, application Japan, Apr. 5, 1977, 52-38146
Int. Cl.³ F16H 57/10
U.S. Cl. 74—783 12 Claims



1. In an automatic transmission assembly for a motor vehicle including
an overdrive device having an axis of rotation and defining a radial direction,
an input shaft for said overdrive device,
a planetary gear assembly including a sun gear, a ring gear, planet pinions and a carrier rotatably supporting said planet pinions, said carrier being connected with said input shaft, and
a one-way clutch for selectively coupling said sun gear with said carrier, said one-way clutch including an outer race and an inner race, with said inner race being affixed with said sun gear,
the improvement comprising that a splined coupling is provided between said outer race of said one-way clutch and said carrier to operatively couple said carrier and said outer race, said splined coupling being structured to enable a predetermined degree of relative movement particularly in the radial direction of said overdrive device between said carrier and said outer race.

4,455,891

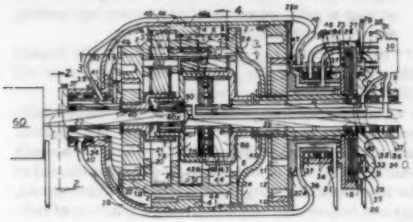
POWER TRANSMISSION CONFIGURATION HAVING CONTINUOUS VARIABLE PROGRESSION OF GEAR REDUCTION RATIOS

Gerald A. Freeman, 205 W. Maywood, Peoria, Ill. 61604

Continuation-in-part of Ser. No. 111,335, Jan. 11, 1980, abandoned. This application Apr. 13, 1981, Ser. No. 253,480

Int. Cl.³ F16H *3/44, 57/10*

U.S. Cl. 74—793 3 Claims



1. A hydraulically controlled variable ratio transmission comprising:

an input shaft;

an output shaft;

an epicyclic gearing means further comprising two semi-independent planetary gear arrangements for operatively connecting said input shaft with said output shaft;

primary and secondary fluid pumps, each having an inner gear and an outer gear, said inner and outer gears being carried in eccentric disposition with respect to one another within respective primary and secondary pump bodies;

said input shaft being splinably connected to an input sun gear of said epicylic gearing means, and to the inner gear of said primary fluid pump; said input sun gear being in mesh with at least one planet gear journalled upon a planet gear journalling carrier of said epicylic gearing means; said planet gear journalling carrier being integrally connected to the pump body of said primary fluid pump and also to the inner gear of said secondary fluid pump; said planet gear journalling carrier and a compound ring gear of said epicyclic gearing means dually interconnect said two semi-independent planetary gear arrangements of said epicyclic gearing means; said at least one planet gear being additionally in mesh with said compound ring gear; said compound ring gear engaging at least one output planet gear and being integrally connected to the pump body of said secondary fluid pump; and said at least one output planet gear being in mesh with a reverse planet gear meshing with a reverse sun gear, and being in mesh with a forward output sun gear;

said output shaft having a bored end to be rotatably supported by an axially extended portion of said input shaft;

said output sun gear and said reverse sun gear journalled upon said output shaft to be alternately and selectively fixed with said output shaft via one of two output clutches, selectively;

said output sun gear and said reverse sun gear being bored and shaped to house and containerize said output clutches with a common servo piston further containerizing and selectively activating the said output clutches alternately;

a carrier retention brake for selectively fixing said planet gear journalling carrier with an outer case to provide directional stabilization during start-up, neutral, and reverse modes of operation; and flow control means for directing the fluid flow from said primary fluid pump and for restricting the fluid flow from the secondary fluid pump so that the relative rotation of the inner and outer gears of the respective fluid pumps will be varied, thus effecting a continuously variable ratio change from said input shaft to said output shaft.

4,455,892

HYDRAULIC CONTROL MEANS FOR AN AUTOMATIC TRANSMISSION

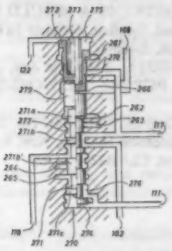
Shiro Sakakibara, Minamiodori 4 chome, Toyokaya Aichi Prefecture, Japan

Filed Feb. 4, 1982, Ser. No. 345,642

Claims priority, application Japan, Sep. 4, 1978, 53-108852

Int. Cl.³ B60K *41/10*

U.S. Cl. 74—869 4 Claims



1. A hydraulic control means for an automatic transmission comprising:

an input shaft,

an output shaft,

a planetary gear mechanism installed between said input shaft and said output shaft,

plural friction elements including a friction clutch or a friction brake, wherein a gear ratio of plural stages in a forward-running and a gear ratio in a reverse running are obtained by engaging or releasing suitably said friction elements with hydraulic (oil) pressure,

a source of oil pressure,

a pressure regulator valve means controlling the pressure generated by said source,

a governor valve means which generates governor pressure expressed according to driving speed,

a throttle valve means which generates throttle pressure expressed according to driving load, and

a shift valve means which changes over low speed and high speed by providing said throttle pressure and governor pressure, wherein said shift valve means comprises:

a primary valve means which acts between a position in low gear ratio and the position in high gear ratio,

a secondary valve means which acts between the position disposed to said primary valve means in low gear ratio and the position disposed to said primary valve means in high gear,

a spring means giving power to said secondary valve means in the direction to said primary valve means,

a primary hydraulic pressure chamber, wherein said governor pressure pressing said primary valve means to the position of high gear ratio is input,

a tertiary hydraulic pressure chamber, wherein said governor pressure is input when said valve means is in low gear ratio, wherein said primary valve means is pressed to the direction of low gear ratio, and said governor pressure is intercepted when said primary valve means is in high gear ratio,

a fifth hydraulic pressure chamber, wherein said hydraulic pressure is input when said valve means is in low gear ratio, wherein said primary valve means is pressed to the direction of low gear ratio, and said hydraulic pressure is intercepted when said primary valve means is in high gear ratio, and said hydraulic pressure is connected to an exhaust port; and

a secondary hydraulic pressure chamber, wherein said throttle pressure is input, said primary valve means is pressed to

the position of low gear ratio, and said secondary valve means is pressed to the direction against spring means; and a fourth hydraulic pressure chamber, wherein said hydraulic pressure is input when said primary valve means is in low gear ratio, said secondary valve means is pressed to the direction against said spring means and said hydraulic pressure is connected to an exhaust port when said secondary valve means is in high gear ratio.

4,455,893

METHOD IN PRODUCING A MOULD FOR A LENS

Ulf J. Asterö, Östersund, Sweden, assignor to Optik Innovation AB OIAB, Östersund, Sweden

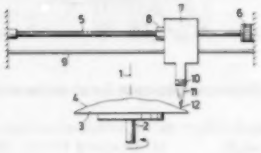
PCT No. PCT/SE81/00319, 371 Date Jun. 21, 1982, 102(e) Date Jun. 21, 1982, PCT Pub. No. WO82/01494, PCT Pub. Date May 13, 1982

PCT Filed Oct. 28, 1981, Ser. No. 395,039

Claims priority, application Sweden, Nov. 6, 1980, 8007812

Int. Cl.³ B23K *26/00*

U.S. Cl. 76—107 R **8 Claims**



1. A method for production of a metal mould for moulding a rotational symmetric lens, comprising mechanically removing material from the surface of a mould metal blank to form a rotational symmetric blank surface having substantially the desired surface shape, and reducing the mould surface irregularities resulting from the material removing operation in order to form an optically smooth mould surface characterized thereby that said reducing comprises rotating the surface shaped blank about the axis of symmetry, directing a laser beam in parallel with said axis onto said blank surface, displacing the laser beam radially relative to said surface and bringing the laser beam to melt the top layer of the mould surface thereby to smooth out said irregularities.

4,455,894

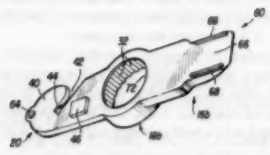
HAND HELD OPENING APPARATUS

Richard D. Roberts, 157 Kenwood St., Elyria, Ohio 44035

Continuation-in-part of Ser. No. 440,008, Nov. 8, 1982, abandoned. This application Jul. 6, 1983, Ser. No. 511,098

Int. Cl.³ B67B *7/44, 7/40, 7/18, 7/30*

U.S. Cl. 81—3.1 R **4 Claims**



1. A hand held opening apparatus for a plurality of different containers consisting of

a. a flat, substantially solid plastic member having substantially flat upper and lower surfaces throughout its length,

b. a pop top can opening device located at one end of said flat plastic member, said pop top can opening device consisting of

(1) a bevelled surface extending from one end of said flat upper surface to said lower surface providing a wedge-shaped end adapted to be inserted beneath a pull tab of a pop top can, said bevelled surface further extending completely across said flat plastic member,

(2) a pair of laterally-spaced and longitudinally extending rib members extending upwardly from said flat upper surface,

(a) said rib members being spaced laterally a distance slightly greater than the width of said pull tab and serving as guide means to retain said pop top opening device beneath said pull tab,

c. and a twist-off bottle cap opening device centrally located with respect to said flat plastic member, said twist-off bottle cap opening device consisting of

(1) a centrally located portion of said flat, substantially solid plastic member having a hollow hub member extending from said upper surface to a location beneath said lower surface of said plastic member and adapted to be telescoped over a twist-off bottle cap to be opened,

(a) said hollow hub member having a plurality of radially inwardly extending lug members each extending for substantially the full length of said hollow hub member,

(b) and radially inwardly extending overhanging means in line with said upper surface, said overhanging means extending radially inwardly a distance greater than said lug members, said overhanging means serving to limit the depth to which said bottle cap opener may be telescoped over said twist-off bottle cap.

4,455,895

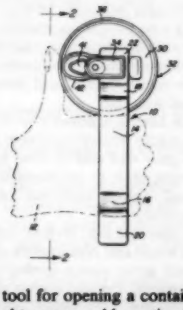
BEVERAGE CAN OPENER TOOL

Robert F. Christensen, Miles City, Mont., assignor to Clyde M. McFarland; Joyce J. Janssen and Shirley I. Gibson, all of Miles City, Mont.

Filed Aug. 26, 1982, Ser. No. 412,526

Int. Cl.³ B67B *7/40*

U.S. Cl. 81—3.46 R **4 Claims**



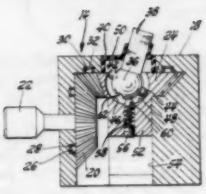
1. A can opener tool for opening a container having a pull tab which is attached to an openable section located in the top of the container, the tool comprising a rigid bar including a substantially planar elongate handle portion and a substantially planar terminal portion at one end of the handle portion, the terminal portion being adapted to fit under a container tab and being offset downwardly from the handle portion by means of a bend in the bar, the terminal portion extending upwardly toward its free end at an angle in the range between about 2° and 7° to the plane of the handle portion.

4,455,896

WRENCH STRUCTURE

Freddy Holmes, 9521 Hamilton, Belleville, Mich. 48111

Filed Dec. 28, 1981, Ser. No. 334,825
Int. Cl.³ B25B *17/00*
U.S. Cl. 81—57.26 **2 Claims**



1. A wrench structure, comprising:
a body having a first opening and a second opening;
a first bevel gear member nested in said body adjacent said first opening so as to be rotatable in either a first rotary direction with respect to the body, or in the opposite rotary direction, the first gear member having an annular array of teeth, and a partially spherical opening;
a partially spherical joint member mounted in the first gear member opening;
each of said members having groove means;
a pair of balls, slideably disposed in said groove means between the first gear member and the joint member and on opposite sides of the joint member whereby the joint member is pivotal with respect to the first gear member about an axis passing through the pair of balls, and is rotatable with respect to the body in a second rotary direction defined by the groove means;
the joint member being movable with the first gear member at such times as the first gear member is being moved in either said first rotary direction, or in said opposite direction;
stud means carried by the joint member in the first body opening for releaseably connecting a wrench member;
a second bevel gear member rotatably mounted in the body adjacent the second body opening, the second gear member being meshed with the first gear member so as to rotate same at such times as the second gear member is being rotated;
means mounted in the second body opening and connected to the second gear for rotating same such that the stud means can be turned within a range of selected angles with respect to the axis of rotation of the second gear member; and
spring biased detent means mounted in the body and engaged with the joint member to releasably lock same in a predetermined position with respect to the body.

4,455,897

SOCKET WRENCH DEVICE

Adrian D. Jones, Rte. 1, Box 78-A, Elberton, Ga. 30635

Filed Sep. 10, 1980, Ser. No. 185,755
Int. Cl.³ B25B *13/46*
U.S. Cl. 81—61 **2 Claims**

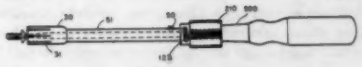
1. A socket wrench device comprising:
a wrench handle;
a drive head carried adjacent an end of said wrench handle;
a removable socket having a closed continuous periphery and being open on one end for engaging and driving a nut member in rotation;
a circumferential guide groove formed inwardly around an exterior side of said socket having a bottom most surface formed therein;
a plurality of circumferentially spaced side openings located in said bottom most surface in said groove so that said groove guides pawl fingers into said openings;
said drive head including an annular opening defined by a closed peripheral wall and opposing open ends adapted for receiving said socket therein;
a drive mechanism included in said drive head having a plurality of pivotable spring-loaded pawl fingers carried radially inwardly extending into said annular opening;
said drive head including a plurality of recesses formed circumferentially therein having an opening facing into said annular opening, said recesses being defined by side portions, said pawl fingers being pivotably carried in said recesses and biased against said side portions when effecting rotation and pivoting inwardly toward said opening of said recesses in a reverse direction;
pins vertically carried in said recesses, said pawl fingers being pivotably carried by said pins;
spring means biasing said pawl fingers against said side portions;
said guide groove guiding said pawl fingers to said side openings following engagement of said pawl fingers in said groove;
said pawl fingers adapted for engagement in corresponding side openings in said groove of said socket;
said fingers effecting rotation of said socket when in engagement therewith and said wrench handle is rotated in a first direction while disengaging from said socket when rotated in said reverse direction; and
said wrench handle drive head engaging said socket about said exterior side facilitating use in a minimum of vertical space.

4,455,898

TOOL FOR CAPTURE, CONTROL AND MANIPULATION OF THREADED FASTENERS

Edgar F. Marbourg, Jr., 437 Hillcrest Rd., San Carlos, Calif. 94070

Filed Jun. 7, 1982, Ser. No. 385,540
Int. Cl.³ B25B *23/08*
U.S. Cl. 81—454 **12 Claims**



1. A barrel or sleeve of stiff but resiliently deformable material for use with an associated bit of similar material or a screwdriver inserted through said barrel and cooperating therewith, each end of said barrel being slit longitudinally into a plurality of segments symmetrically and circularly disposed, further providing
that at one end the segments are relatively thin and act as resilient flexible members comprising screw-gripping means in association with annular grooves and shoulders on the interior surfaces of said segments which positively grip a screw head accepted by the flexible segments, which said segments expand outward to accept a screw head, then contract in upon it;
that at the other end, said barrel ends in a truncated cone slit into segments which are relatively short and thick, said conical surface being associated with exterior threads on the adjacent cylindrical surface of said barrel, said threads being adapted to accept a threaded collar which encloses the said conical end of the said barrel; said collar interiorly disposes a conical surface which cooperates with said truncated cone on the end of said barrel so that as the collar is advanced on said barrel by the action of said threads, the said segments of the conical end of the barrel are compressed to grip the shaft or bit within said barrel and hold said bit or shaft fixed with relation to said barrel as desired.

4,455,899

IMPACT WRENCH

Harvey E. Savell, Rte. 1, Box 130, Little Rock, Miss. 39337

Filed May 24, 1982, Ser. No. 381,043

Int. Cl.³ B25B *19/00*

U.S. Cl. 81—466 **8 Claims**

1. An impact wrench for loosening and tightening nuts, comprising a lug bar and a drive means on one end of said lug bar; a first collar segment and a second collar segment journalled for rotation on said lug bar in spaced relationship; a first pair of struts having one end rigidly attached to said first collar segment and the opposite end extending outwardly from said first collar segment in oppositely-disposed relationship; a second pair of struts having one end rigidly attached to said second collar segment and the opposite end extending outwardly from said second collar segment in oppositely-disposed relationship; first impact bar means connecting the ones of said struts which extend in a first direction from said first collar segment and said second collar segment, respectively; second impact bar means connecting the ones of said struts which extend in a second direction from said first collar segment and said second collar segment, respectively; and a pivot base means attached to said opposite end of each of said struts extending in said first direction and said second direction, respectively; handling means attached to said pivot base means and an impact arm rigidly attached to said lug bar and extending outwardly from said lug bar and into the rotational path of said first and second impact bar means whereby rotation of said handling means causes said first and second impact bar means to contact said impact arm and apply a torque to said lug bar.

4,455,900

BRAKE LATHE

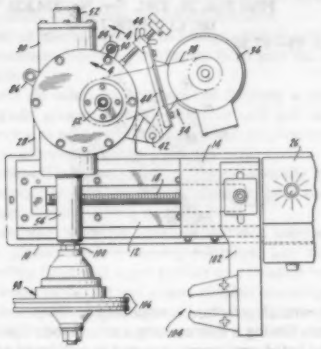
Dennis T. Callanan, West Hartford, Conn.; Gerald P. Lawson, Winona, Minn., and Francis J. Reardon, South Hadley, Mass., assignors to Winona Tool Manufacturing Company, Winona, Minn.

Filed Jun. 12, 1981, Ser. No. 273,001

Int. Cl.³ B23B *5/02*

U.S. Cl. 82—4 A **1 Claim**

1. In a brake lathe, a base, a tool slide and tool holder on the base adapted to hold a brake refinishing tool, means for moving the tool slide and tool holder on the base in a defined direction to perform a working operation, a spindle housing mounted on the base and having a rotatable spindle mounted thereon for releasably holding either a brake drum or a brake disc to be refinished, power means for rotating the spindle, means for indexing the spindle housing, and thus the spindle, through 90° to dispose the spindle either parallel to the direction of movement of the tool slide in a brake drum refinishing position or at right angles to the direction of movement of the tool slide in a brake disc finishing position, means for releasably locking the spindle housing in each of these two positions, and work holding means at each end of the spindle constructed and arranged so that a brake drum may be releasably mounted on one end of



the spindle and a brake disc may be releasably mounted on the other end of the spindle.

4,455,901

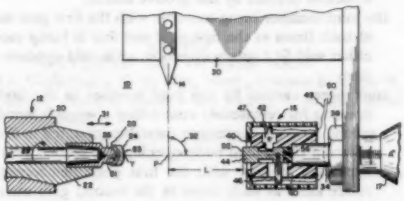
APPARATUS FOR CONTROLLING LATHED CONTACT LENS THICKNESS

Buford W. Council, Jr., Ruskin, Fla., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed Oct. 9, 1981, Ser. No. 310,341

Int. Cl.³ B23B *3/28*; **B23Q** *15/00*; **H01H** *15/00*

U.S. Cl. 82—12 **5 Claims**



1. A contact lens lathing machine for generating a vision surface on a contact lens at a machine cut position, comprising:

a rotatable spindle for carrying a contact lens workpiece having a work surface disposed for lathing;

a lathe tool for cutting the contact lens workpiece when disposed at the machine cut position at the lens work surface to generate a vision surface of predetermined curvature for a lens of predetermined thickness;

a transducer including a stationary, nonelectrically conductive first subassembly having an electrical contact and a movable, electrically conductive second subassembly having an electrical contact, the second subassembly being slidably received within the first subassembly, the contact of said first subassembly being electrically engaged to said second subassembly when said contact of said second subassembly is in a first position to provide an electrical path, the contact of said second subassembly moved to a second position and the transducer providing an electrical response by movement of the second subassembly relative to the first subassembly imparted by the physical interference between the second subassembly and the work surface of the contact lens workpiece;

measuring means mounted to the stationary first subassembly for engaging and measuring movement of the second subassembly upon contact between the worksurface of the contact lens workpiece and the second subassembly and

a controller responsive to the electrical response provided by the transducer for registering the physical interference location relative to the cut position to generate control signals for disposing the lathe tool with respect to the contact lens workpiece for generating, as a function of the electrical response, a vision surface of predetermined curvature for a lens of predetermined thickness.

4,455,902

APPARATUS FOR PARTING-OFF PIECES, PARTICULARLY CANDY, FROM A STRAND OF MATERIAL, PARTICULARLY A SOFT PLASTIC STRAND OF MATERIAL

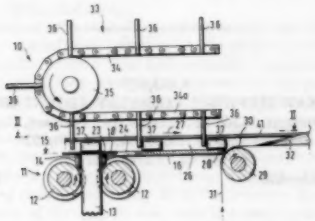
Heinz Schmitz, Hurth-Efferen, Fed. Rep. of Germany, assignor to Rose Verpackungsmaschinenfabrik Theegarten GmbH & Co., Cologne, Fed. Rep. of Germany

Filed Apr. 18, 1983, Ser. No. 486,059

Claims priority, application Fed. Rep. of Germany, May 5, 1982, 3216770

Int. Cl.³ B26D *1/28*; A23G *1/20*, *3/06*

U.S. Cl. 83—150 **29 Claims**



1. Apparatus for parting-off pieces from a strand of material and conveying the parted-off pieces in a conveying direction along a conveying surface comprising, means providing an elongate conveying surface, means to displace said strand transverse to said conveying surface, a parting-off knife comprising driven knife blade means disposed in the plane of said conveying surface and having cutting edge means disposed in said plane and displaced in said conveying direction to part-off pieces from said strand, and driven continuous conveyor means including entrainment means spaced apart and displaced in the conveying direction for engaging behind parted-off pieces and displacing the pieces along said conveying surface.

4,455,903

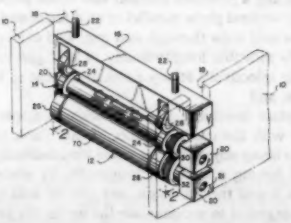
ADJUSTABLE ANVIL ROLL

Martin Kesten, West Hartford, Conn., assignor to Preston Engravers, Inc., Windsor, Conn.

Filed Nov. 15, 1982, Ser. No. 441,637

Int. Cl.³ B26D *7/20*

U.S. Cl. 83—346 **7 Claims**



1. A variable diameter anvil roll, having a self-contained hydraulic system, for cooperation with an adjacently mounted die cutting roll, comprising: a core member having a cylindrical body portion and shaft portions extending axially from the opposite ends thereof for journalling in the press; annular bearers adjacent said opposite ends of said body portion; a resiliently deformable tubular sleeve member affixed upon said body portion between said bearers, said sleeve member having an inside diameter slightly larger than the outside diameter of said body portion and being sealed thereto adjacent its opposite ends to define a shallow cylindrical space therebetween, said core member having a passageway extending thereinto from each end into communication with said cylindrical space; first closing means sealingly engaged within one of said passageways, and second closing means sealingly engaged within the other of said passageways, said first closing means including a sealing piston and being adjustable to vary the position of said piston along the length of said one passageway, the outside diameter of said sleeve member normally being smaller than that of said bearers to dispose its outer surface slightly below the surfaces thereof, whereby said cylindrical space between said sleeve member and said body portion can be filled with a hydraulic fluid and pressurized, by adjustment of said first closing means, to distend said sleeve member, said outer surface of said sleeve member thereby being brought to positions flush with and slightly above said bearer surfaces, and through an infinite range of positions therebetween.

4,455,904

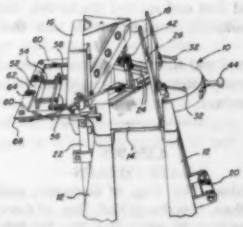
WORK FRAME CUTTING SUPPORT

Charles W. Havner, 1025 Campbell, and Roger R. Havner, P.O. Box 3816, both of Jackson, Tenn. 38301

Filed Sep. 30, 1982, Ser. No. 431,796

Int. Cl.³ B26D *3/14*

U.S. Cl. 83—375 **6 Claims**



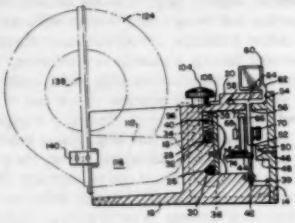
1. A safety attachment for use with a cutting apparatus which includes a cutting member adapted to reciprocate vertically with respect to a fixed frame structure, the safety attachment comprising a support bar mounted for movement with the cutting apparatus having successive cutting positions and movable through successive work positions, at least one crank means having one end pivotally coupled to the support bar, having its fulcrum connecting means for fixedly positioning the fulcrum from a reference point on the cutting apparatus, and having the other end of the crank means free and containing an aperture therein, a working rod threaded at one end and threadedly engaging a coupling means and an intermediate portion thereof proximate about the other end of the working rod adjustable engaging in slidable relation with a rod support means having pivot means coupled to said aperture, and rabbet holder means having linking means coupling between the rabbet holder means and the threadedly engaging coupling means.

4,455,905

DISPENSER MEANS FOR ROLLED SHEET MATERIALS

Gary E. Raymond, 755 S. Rainbow Dr., Hollywood, Fla. 33021

Filed Sep. 7, 1982, Ser. No. 415,656
Int. Cl.³ B65H 75/32
U.S. Cl. 83—422 10 Claims



1. Dispenser means for rolled sheet materials, such as negative stock, emulsified paper, and like photographic supplies, comprising:

a walled housing;

said housing having means therewithin (a) for grasping an end of rolled sheet material, and (b) for moving such sheet material through said housing along a given pathway;

said housing also having means therewithin, and interposed intermediate said pathway, for severing a selective length of sheet material; wherein

said severing means comprises a cutting tool, a rib to which said cutting tool is secured, an element having a planar portion and a bight portion, said rib being secured to said planar portion in an attitude normal thereto, and a handle secured to said bight portion; and

said housing has, formed in a wall thereof, first and second trackways offset from each other in parallel planes, and a third trackway, normal to said first and second trackways and opening onto each thereof; and

said rib is slidably engaged with one of said first and second trackways, said bight portion is slidably engaged with the other of said first and second trackways, and said planar portion is slidably engaged with said third trackway; whereby

said first, second and third trackways cooperate to define a serpentine entry into said housing to inhibit an admittance of light thereinto.

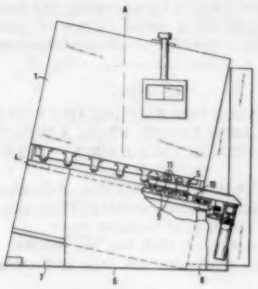
4,455,906

GATE SHEARS

Harro Reiff, Schloss, Fed. Rep. of Germany, assignor to Karl Mengele & Söhne, Gunzburg, Fed. Rep. of Germany

Filed Oct. 30, 1981, Ser. No. 316,969
Int. Cl.³ B23D 15/08, 33/02
U.S. Cl. 83—438 5 Claims

1. In sheet metal gate shears a shears run-in table for feeding metal sheets to the shears having a pair of opposite ends and a pair of sides extending between said ends, said sheet metal shears comprises a movable upper shear blade and a lower stationary shear blade located at one end of said table, said table having a pair of opposite sides extending in the direction of movement of the sheets over said table toward the shears, lateral stop means for said shears run-in table extending along one of said pair of sides, characterized in that said table and said lower blade (4) are inclined downwardly toward said lateral stop means (5), said lateral stop means extends along the length of said one of said pair of sides from said lower blade, said table having a first section (2*a*) extending along and adjacent to said lateral stop means and a second section considerably wider than said first section extending for the remainder of the width of said table between said pair of sides thereof, clamping means located only in said section (2*a*) situated adjacent to said lateral stop means (5), and said section (2*a*) of said table (2) adjacent to said stop means arranged so that said



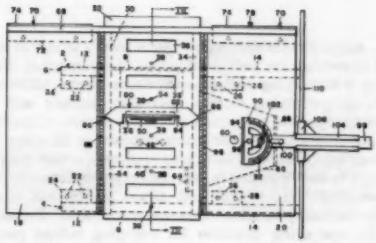
clamping means can be moved along in the direction in which said one of said pair of said sides extends.

4,455,907

TABLE SAW HAVING LATERALLY ADJUSTABLE SAW

Alvin L. Bassett, 11365 SE. Stevens Rd., Portland, Oreg. 97266

Filed Feb. 28, 1983, Ser. No. 470,292
Int. Cl.³ B27B 5/22
U.S. Cl. 83—438 11 Claims



1. A table saw comprising:

a. a base,

b. a table top carried by said base and comprising a pair of horizontal slabs spaced apart to form a parallel sided gap therebetween extending the full length of the table top,

c. a fixedly mounted fence extending across the rearward edge of said table top, bridging said gap and rising above the upper surfaces of said slabs,

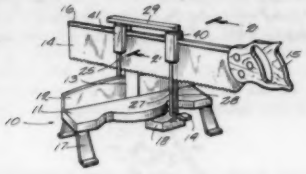
d. a saw carriage mounted on said table top beneath said gap and including a powered circular saw blade disposed in a generally vertical plane parallel to said fence and projecting above said slabs through said gap, said carriage being adjustably movable longitudinally of said gap to dispose said blade selectively at any point in the entire length of said table, and

e. a filler plate overlying said gap with its upper surface coplanar with the upper surfaces of said slabs, said filler plate also being adjustably movable longitudinally of said gap, and having a series of longitudinally spaced apart apertures found therethrough, any one of said apertures being engageable to accomodate the upwardly projecting portion of said saw blade, whereby said filler plate may cover said gap substantially completely at any position of said saw blade longitudinally of said gap.

4,455,908
MITER SAW GUIDES

Burton G. Keddie, Elm Grove, Wis., assignor to Hempe Manufacturing Company, Inc., New Berlin, Wis.

Filed Feb. 26, 1982, Ser. No. 352,966
Int. Cl.³ B27G 5/02
U.S. Cl. 83—767 2 Claims

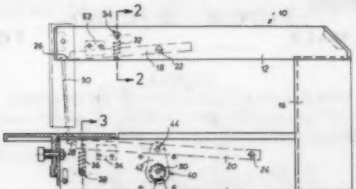


1. Mitering saw apparatus comprising:
a table for supporting a workpiece that is to be sawed,
an arm mounted to said table for swinging about a vertical axis in a horizontal plane,
first and second pairs of shafts mounted to said arm in longitudinally spaced apart relationship, the shafts in each pair being parallel to each other and disposed, respectively, at equal distances from and on opposite sides of the plane in which a saw is to be moved to cut a workpiece on said table,
a roller on each shaft in a pair, each roller having a plurality of axially spaced apart annular grooves and resilient rings having circular cross sections disposed in said grooves and extending radially outwardly from the grooves, the outer peripheries of the rings on one roller in a cooperating pair being substantially in tangential point contact with corresponding rings in the other roller of the pair, such that when any saw blade within a predetermined range of thicknesses is inserted between the rings on the rollers in a pair the peripheries of the rings deform uniformly to make contact with the blade over an area slightly greater than a point and apply opposing forces to opposite sides of the saw blade to thereby guide the blade.

4,455,909
HACKSAW MACHINE

Alfred Wilbs, Wiesenstrasse 5, D-7896 Wutöschingen, Fed. Rep. of Germany

Filed Feb. 4, 1983, Ser. No. 463,692
Claims priority, application Fed. Rep. of Germany, Feb. 13, 1982, 3205231
Int. Cl.³ B23D 45/06
U.S. Cl. 83—777 10 Claims

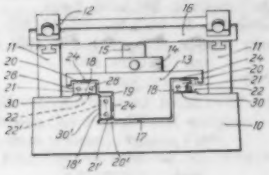


1. A hacksaw machine comprising a U-shaped frame consisting of a first and a second horizontal bracket spaced one above another and an upright post, a first swinging arm pivotably mounted in the first bracket and a second swinging arm pivotably mounted in the second bracket, an eccentric or cranked shaft driving means connected with the first swinging arm, a saw-blade fastened at the front ends of the first and second swinging arms and spring means engaging with at least one of the first and second swinging arms for tensioning the saw-blade characterized in that the swing radius of one of the swinging arms is substantially twice as great as that of the other one and that the spring means comprises a spring one end thereof fastened at the second swinging arm and the other end thereof fastened at the second bracket.

4,455,910
TRAVERSING MICROTOME WITH AIR BEARINGS

Winfried Kraft, Asslar-Werdorf; Gerhard Pfeifer, Solms; Artur Reichel, Wetzlar, and Kurt Richter, Ehringshausen-Katzenfurt, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Nov. 4, 1982, Ser. No. 439,314
Claims priority, application Fed. Rep. of Germany, Nov. 6, 1981, 3144120
Int. Cl.³ G01N 1/06
U.S. Cl. 83—874 11 Claims



1. A traversing microtome, comprising:
a base;
a blade mounted on said base;
a movable carriage adapted to hold an object to be cut by said blade upon movement of the carriage with respect to the blade;
guide members along which said carriage is movable with respect to said base;
means for selectively creating an air-cushioned suspension of said carriage with respect to said base, whereby substantially frictionless movement of said carriage along said guide members can be achieved; and
means, including at least one magnet positioned in the vicinity of one of said guide members, for urging said carriage into a stopped position with respect to said base.

4,455,911
ELECTRONIC MUSICAL INSTRUMENT OF FREQUENCY MODULATION TONE SYNTHESIS TYPE

Shigeru Yamada, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

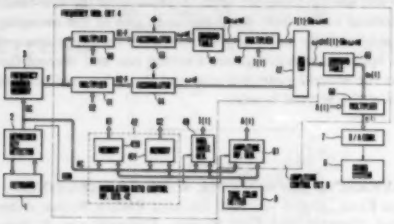
Filed May 17, 1982, Ser. No. 378,824
Claims priority, application Japan, Jun. 12, 1981, 56-86977
Int. Cl.³ G10H 1/14
U.S. Cl. 84—1.19 9 Claims

1. An electronic musical instrument for synthesizing a musical tone signal e(t) expressed as:

$$e(t)=A \sin [\omega ct+I \sin \omega mt]$$

where A represents an amplitude information, I represents a modulation index information, and ωct and ωmt represent a carrier frequency information and a modulation frequency information which are related to a note pitch of a depressed key of the electronic musical instrument comprising: keyboard means having a plurality of keys; a modulation radio control information generator for generating a modulation ratio infor-

mation whose value varies in accordance with a pitch of the depressed key among said plurality keys; and means for vary-



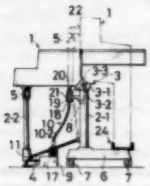
ing at least one of said informations ωct and ωmt in accordance with said modulation ratio control information.

4,455,912

KEYBOARD MUSICAL INSTRUMENT

Shinji Tagaki, Hamamatsu, Japan, assignor to Kabushiki Kaisha Kawai Gakki Seisakusho, Shizuoka, Japan

Filed Jan. 26, 1982, Ser. No. 342,887
Claims priority, application Japan, Jan. 29, 1981, 56-10209[U]
Int. Cl.³ G10C *3/02*
U.S. Cl. 84—177 **8 Claims**



1. A single keyboard musical instrument comprising:
(a) a single main body having a horizontal playing position and a vertical upright position;
(b) first and second leg means comprising respectively at least one rear leg and at least one front leg positioned on said main body for supporting said main body in said playing position, said first leg means further comprising a leg base extending horizontally from a lowermost portion of said at least one rear leg, and stopper means on said leg base spaced apart from said at least one rear leg for contacting said main body when said main body is in its upright position to maintain said body in said upright position; and
(c) hinge means connecting said main body and said first leg means, said main body being pivoted about said hinge means for moving said main body between said playing position and said upright position.

4,455,913

COLLAPSABLE DRUM

Ward L. Willis, P.O. Box 95, Breinigsville, Pa. 18031

Filed Sep. 20, 1982, Ser. No. 419,982
Int. Cl.³ G10D *13/02*
U.S. Cl. 84—412 **4 Claims**

1. In a telescoping drum of the type having a plurality of shell rings nestable to reduce the height of the drum shell from a open or playing height for storage and transportation, the improvement comprising:
a main shell ring having a channel shaped cross-section, the flanges of the channel being turned inwardly toward the inside of said drum shell;
at least one pair of intermediate shell rings having a first outwardly turned lip or flange slidable within said main shell ring and adapted to contact respective flanges of said channel as the intermediate rings are urged apart to extend the shell of said drum to playing height and an inwardly turned lip or flange at the end of each ring opposite said outwardly turned lip;
a pair of drum head supporting means having an upper vertically disposed ring portion over which a drum head can be stretched mounted on a horizontally disposed base flange portion for supporting drum head tensioning means and a lower vertically disposed ring portion depending from said base flange, said depending ring portion termi-

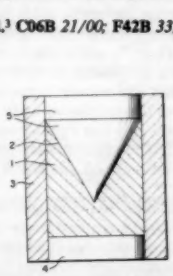
nating in an outwardly projecting lip, said outwardly projecting lip of said lower depending vertical ring portion supporting said intermediate shell rings and, in cooperation with said main shell ring, maintaining the position of said intermediate rings between said main shell ring and said drum head supporting means when said drum is open; and
means for maintaining the position between said heads when said drum is expanded for playing, said maintaining means including spring means disposed within said shell acting on the horizontal flange portion of said drum head supporting means.

4,455,914

PROCESS FOR THE PRODUCTION OF COMPACTED EXPLOSIVE DEVICES FOR AMMUNITION OR EXPLOSIVE CHARGES, ESPECIALLY THOSE OF A LARGE CALIBER

Wolfgang Christmann, Bergisch-Gladbach-Paffrath; Gerhard Lindner, Rosrath, and Paul Lingens, Odenthal, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 98,948, Nov. 30, 1979, abandoned. This application Jul. 1, 1982, Ser. No. 394,643
Claims priority, application Fed. Rep. of Germany, Dec. 4, 1978, 2852358
Int. Cl.³ C06B *21/00*; F42B *33/10*
U.S. Cl. 86—1 R **7 Claims**



1. A process for the production of compacted explosive devices for large caliber ammunition or explosive charges which comprises compacting an explosive material under a low compacting pressure to form a pressed preform with a

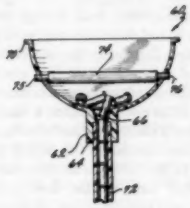
shaped configuration deviating from a final configuration of a finished pressed explosive device which is obtained by further compacting of the pressed preform, said pressed preform and said finished pressed explosive device having zones of differing thicknesses, further compacting the pressed preform in a finishing compacting step under a high compacting pressure to reduce the volume of the preform by 2 to 20%, the zones of the pressed preform of a smaller thickness being provided with dimensions almost the same as that of the finished pressed explosive device and the zones of the pressed preform having a larger thickness being formed with a larger excess dimension and during the finishing compacting step, a greater recompression being effected in a controlled manner in the zones of the larger thicknesses than in the zones of the smaller thicknesses to provide a homogeneous finished pressed explosive device.

4,455,915

CARTRIDGE HOPPER FOR LOADING MACHINE

Charles R. Ransom, P.O. Box 308, Highland, Calif. 92346

Filed Apr. 5, 1982, Ser. No. 365,176
Int. Cl.³ F42B *33/00*
U.S. Cl. 86—46 **6 Claims**



1. As an article of manufacture, a feed hopper for cartridge cases for use with a cartridge loading machine, in combination, a feed tube having a bore for directing shell casings with the end rim downward to the loading machine, a hopper at the upper end of the feed tube, the hopper having an opening at the bottom aligned with the said feed tube to receive cartridge casings which have a center of gravity closer to the rim end of the casing than to the open end, there being a tapered counterbore between said feed bore and said opening, said tapered counterbore being of substantial length relative to the length of a cartridge and said opening being substantially larger than said bore, the hopper having an open top to receive cartridge casings, the hopper having a smoothly curved, hemispherical, interior contour extending from the top to the perimeter all the way to the said opening whereby cartridges within the hopper moving downwardly towards the opening orient themselves and drop into the opening with the open end up in the said tube.

4,455,916

ARMAMENT SHORTING ARRANGEMENT

Whittaker Wolden B., Geneva, Fla., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 22, 1982, Ser. No. 350,920
Int. Cl.³ F42C *15/06*
U.S. Cl. 89—1.812 **15 Claims**

1. In combination:

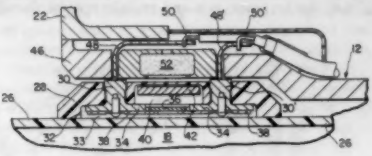
a rocket motor propelled missile round and a launcher therefor;

said round having at least one pair of electrical contacts on its surface connecting with rocket motor ignition circuitry and adapted to receive electrical current from an outside source;

means normally shorting the round electrical contacts for preventing electrical current applied to the round contacts from entering the rocket motor ignition circuitry;

said launcher including a launch tube for receiving the round;

means on the launch tube for disestablishing the round shorting means when the round is loaded into the launch tube;



said launcher including an electrical power source and electrical contacts internally of the launch tube for engaging and selectively supplying current to the round contacts when the round is loaded into the launch tube;

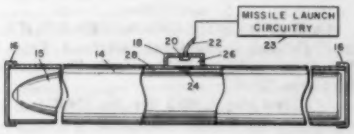
whereby current selectively supplied to the round contacts passed therethrough to the rocket motor ignition circuitry for igniting the rocket motor.

4,455,917

SHOCK WAVE END CAP REMOVAL DEVICE

Richard G. Shook, Sky Forest, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Mar. 15, 1982, Ser. No. 357,933
Int. Cl.³ F41F *3/04*
U.S. Cl. 89—1.817 **4 Claims**



1. An end cap removal device for missile launchers comprising:

an open-ended, elongated cannister for storing and launching self-propelled missiles,

removable end caps attachable to the missile cannister for covering its open ends to protect the interior thereof,

means mountable on said cannister in communication with the interior thereof for generating a pressure in excess of the ambient pressure within said cannister,

means for releasing the pressure of said pressure-generating means to the interior of said cannister to generate a shock wave therein, and

means for actuating said pressure-generating means in the missile-firing sequence.

4,455,918

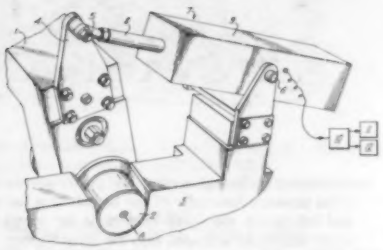
ELEVATION PROTRACTOR FOR TRUNNIONED GUNS

Norman P. Barton, Egham, England, assignor to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jun. 10, 1982, Ser. No. 387,055
Claims priority, application United Kingdom, Jun. 15, 1981, 8118336
Int. Cl.³ F41C *9/00*; F41H *13/00*; G01B *3/30*
U.S. Cl. 89—41 L **4 Claims**

1. An elevation protractor comprising a gun cradle including an opposed pair of trunnions having a common trunnion axis, each of said trunnions being pivotably located in a respective

trunnion bearing so as to be rotatable substantially about the trunnion axis, one of said trunnions being provided with a pivot which is disposed substantially axially parallel to the trunnion axis and radially spaced therefrom, the respective trunnion bearing of said one of said trunnions being provided with a second pivot which is disposed substantially axially parallel to the trunnion axis and radially spaced therefrom, a



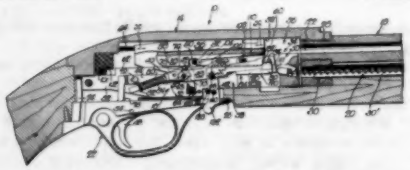
linearly extensible measuring device having two telescopically engaged portions each rotatably attached to a respective one of the said two pivots so as to extend therebetween, said measuring device being operative to provide a linear measurement of the separation of said two pivots, and conversion means for converting said linear measurement into an angular measurement of the angle subtended at the trunnion axis by the said two pivots.

4,455,919

LAST SHOT BOLT HOLD-OPEN DEVICE

William E. Osborne, Guilford, and Nicholas A. Ketre, Clinton, both of Conn., assignors to The Marlin Firearms Company, North Haven, Conn.

Filed May 3, 1982, Ser. No. 374,033
Int. Cl.³ F41D 9/00
U.S. Cl. 89—138 **4 Claims**



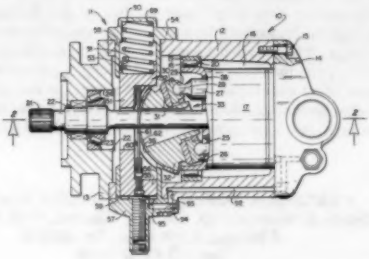
1. In a firearm, the combination with an action having a spring-closed breech bolt reciprocable in the direction of its longitudinal axis, a magazine tube with a cartridge feed spring, a feed throat, a cartridge lifter mounted for pivoting about a fixed axis normal to the longitudinal bolt axis and being urged in lift direction by a lifter spring, with said lifter being bolt-operated into depressed position, and overtraveling in lift direction on cartridge feed interruption to said throat, of an action disabling device providing an operating arm mounted with one end in the action for pivoting about a fixed axis parallel to the pivot axis of the lifter into active and inactive positions in which its other end is in and out, respectively, of the path of the bolt in closing direction, a spring urging said arm into its inactive position, and a finger on the lifter engaging said arm in its inactive position remote from its pivot axis and swinging it to its active position on said overtravel of the lifter to stop the breech bolt in partially closed position, with the bolt being released for full closure on rocking said arm to its inactive position.

4,455,920

ROCKER CAM CONTROL

Edwin L. Shaw, Delaware, and Alan H. Viles, Columbus, both of Ohio, assignors to Abex Corporation, Stamford, Conn.

Filed Jun. 1, 1982, Ser. No. 383,679
Int. Cl.³ F01B 13/04, 25/00
U.S. Cl. 92—12.2 **4 Claims**



1. A variable displacement fluid energy translating device having a housing, a barrel rotatably supported in the housing, a plurality of cylinders formed in the barrel and aligned parallel with the axis of rotation thereof, a piston mounted for reciprocation in each cylinder, a shoe connected to the end of a piston projecting from each cylinder, a rocker cradle, a first arcuate surface formed on the rocker cradle, a rocker cam, a second arcuate surface formed on the rocker cam adjacent and complementary to the first arcuate surface, means for pivotally supporting the rocker cam on the first arcuate surface for movement about an axis perpendicular to the axis of rotation of the barrel, a flat thrust surface on the rocker cam on which the piston shoes slide, means for retaining the shoes against the thrust surface such that the pistons reciprocate within the cylinders when the cam surface is inclined and the barrel is rotated, a stroking piston mounted for reciprocation in the housing, and characterized by means for connecting the stroking piston to the rocker cam including a first flexible connector attached to the rocker cam and to the stroking piston and a second flexible connector attached to the rocker cam and to the stroking piston, wherein tension in the first flexible connector is raised and tension in the second flexible connector is lowered when the stroking piston is moved in one direction and the rocker cam is pivoted toward a position of maximum fluid displacement and tension in the second flexible connector is raised and tension in the first flexible connector is lowered when the stroking piston is moved in the other direction and the rocker cam is pivoted toward a position of minimum fluid displacement, and two pairs of grooves formed in the second arcuate surface of the rocker cam, and a portion of the first flexible connector is received in the first pair of grooves and a portion of the second flexible connector is received in the second pair of grooves.

4,455,921

PISTON-TYPE CONCRETE PUMP

Rolf Griesbach, Dortmund, Fed. Rep. of Germany, assignor to Maschinenfabrik Walter Scheele GmbH & Co. KG, Unna-Massen, Fed. Rep. of Germany

Filed Aug. 6, 1981, Ser. No. 290,695
Claims priority, application Fed. Rep. of Germany, Aug. 8, 1980, 3030005
Int. Cl.³ F15B 13/06
U.S. Cl. 91—191 **5 Claims**

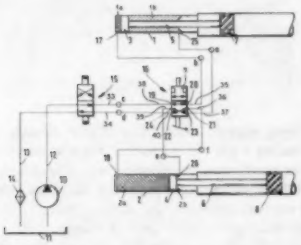
1. A concrete pump comprising:
a pair of separate pump assemblies each having
a cylinder,
a piston subdividing same into a piston-side front compartment and a rod-side rear compartment, and

a piston rod connected to the piston and extending out of the cylinder through the rod-side rear compartment;

liquid supply means having a high-pressure side and a low-pressure side for supplying liquid under high pressure at said high-pressure side and for taking in liquid at said low-pressure side; and

mode-valve means connected to all of said compartments and to both of said sides and having a single valve element movable between:

a piston-side position in which said high-pressure side is connected to the front compartment of one of said



assemblies, said low-pressure side is connected to the other of said front compartments, and said rear compartments are connected together; and

a rod-side position in which said high-pressure side is connected to the rear compartment of the other of said assemblies, said low-pressure side is connected to the other of said rear compartments, and said front compartments are connected together, for direct energization of said assemblies at said front compartment of said one assembly in said piston-side position and at said rear compartment of said other assembly in said rod-side position.

4,455,922

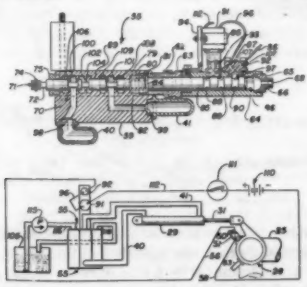
UNLOADING AUGER CONTROL SYSTEM

John E. Brelsford, Terre Hill, and Emmett F. Glass, Akron, both of Pa., assignors to Sperry Corporation, New Holland, Pa.

Division of Ser. No. 59,852, Jul. 23, 1979. This application Sep. 30, 1982, Ser. No. 431,516

Int. Cl.³ F15B *13/16*

U.S. Cl. 91—358 A **12 Claims**



1. A fluid directional control valve connectable to a fluid powered working apparatus and in fluid flow communication with a fluid reservoir comprising:

(a) an elongate main housing with at least one open center bore of generally uniform diameter therein;

(b) at least two reversible flow ports within the main housing operatively associated with said open center bore;

(c) at least one inflow port and one outflow port in the housing to receive the fluid from and return it to the fluid reservoir;

(d) a first spool selectively linearly movable within the bore to control the flow of fluid through the flow ports;

(e) a second spool having a periphery of predetermined shape functionally connected to the first spool, the second spool having at least a first groove, a second groove and a third groove each of a predetermined depth and linearly spaced apart about at least a portion of the periphery;

(f) a centering spring operatively associated with the first spool and the second spool and intermediate thereof;

(g) a second housing having a second open center bore of generally uniform diameter connected to the main housing and coaxial with the bore in the main housing;

(h) a solenoid fastened to the second housing and connectable to an electrical power source via an electrical circuit, the solenoid having a movable detent means cooperable with the second spool so that when the detent means engages the first groove in response to the movement of the second spool in a first predetermined direction the fluid is directed from the reservoir through the control valve in a first working predetermined path of travel to the working apparatus and when the detent means engages the second groove in response to the movement of the second spool in a second predetermined direction the fluid is directed from the reservoir through the control valve in a second working predetermined path of travel to the working apparatus and when the second spool is positioned in response to the centering spring so that the detent means is intermediate of the first and second grooves the fluid flows through the control valve in a third non-working predetermined path of travel;

(i) at least one switch remote from the solenoid and the second housing included in the electrical circuit; and

(j) a second electrical switch fastened to the second housing and connected in series via the circuit to the solenoid and the remote switch cooperable with the third groove such that when the second spool is positioned so that the electrical switch engages the third groove the circuit is broken and the detent means is selectively engageable with the first groove in response to the movement of the second spool in the first predetermined direction and the second groove in response to the movement of the second spool in the second predetermined direction to continue the flow of fluid in the desired path of travel to operate the working apparatus until the electrical circuit is again completed by the remote switch thereby causing the solenoid to disengage the detent means from the second spool permitting the centering spring to return the second spool to the position where the detent means is intermediate of the first and second grooves.

4,455,923

AIR CYLINDER WITH END POSITION DAMPING

Richard Müller, Mehlingen, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 10, 1982, Ser. No. 416,545

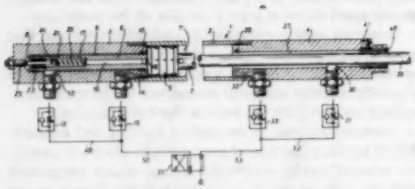
Claims priority, application Fed. Rep. of Germany, Sep. 19, 1981, 3137345

Int. Cl.³ F15B *15/22*

U.S. Cl. 91—394 **6 Claims**

1. An air cylinder, comprising a cylinder member having a main cylinder portion with a main cylinder space, an end portion closing one end of said space and including an axially extending damping bore terminating in an inner closed end and connecting with said space, a stop member adjacent said inner closed end of said damping bore, a first vent hole connected into said damping bore intermediate the length of said damping bore, a second vent hole connected into said main cylinder portion, a first throttle valve connected to said first vent hole, a second throttle valve connected to said second vent hole, a main piston movable in said space, a damping piston carried by

said main piston and movable therewith in front of said main piston toward said inner closed end and having an an axially extending damping piston bore therein communicating with said space and having an open end, a check valve in said damping piston bore closing said end opening of said damping piston bore, said damping piston being moved with said main piston



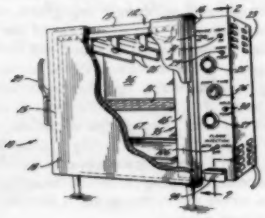
so that adjacent end position of movement of said main piston, the damping piston enters into said axially extending damping bore and engages said stop member with said check valve to open said check valve to permit inflow of air from the damping piston bore into said damping bore so as to vent the damping bore and the space of said main cylinder member ahead of said main piston through said first vent hole.

4,455,924

OVEN FOR COOKING AND FLAVORING MEAT PRODUCTS

Robert J. Wenzel, South Beloit, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.

Filed Sep. 30, 1982, Ser. No. 428,961
Int. Cl.³ A23B *4/04*; A23L *1/00*
U.S. Cl. 99—333 **8 Claims**



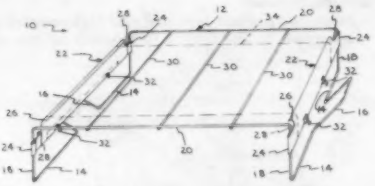
1. An oven for cooking and flavoring meat products, said oven comprising a box-like cabinet having a top wall, a bottom wall, first and second opposing side walls and a rear wall, the front of said cabinet being open, a door connected to said cabinet and adapted to be moved between positions opening and closing the front of said cabinet, jacket means disposed in spaced opposing relation with the inner sides of said top, bottom and side walls and coacting with said rear wall and said door to define a cooking chamber within said cabinet, the outer sides of said jacket means coacting with the inner sides of said top, bottom and side walls to define an air circulation passage between such walls and said jacket means, an electric heating element disposed within said air circulation passage for heating the air in such passage, a fan disposed in said air circulation passage for circulating the heated air around said air circulation passage, a container located adjacent said cabinet and adapted to hold a liquid flavoring agent, and power-operated means for sucking the flavoring agent from said container, for atomizing the flavoring agent and for spraying the atomized flavoring agent into said cooking chamber.

4,455,925

BAKING SHEET

Anthony H. Handal, and Thaddea B. Handal, both of 10 Tudor La., Scarsdale, N.Y. 10583

Filed Apr. 8, 1982, Ser. No. 366,578
Int. Cl.³ A47J *37/00*
U.S. Cl. 99—422 **5 Claims**



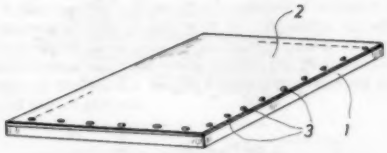
1. A baking utensil, comprising frame means, said frame means including a pair of transverse support members having top surfaces positioned, configured and dimensioned to support a bendable planar baking surface disposed between said transverse support members, and support means for supporting said planar baking surface, with a plurality of confections disposed on said surface, wherein said support means is discontinuous and comprises clamp means and a plurality of secondary support members disposed between said transverse support members having top surfaces slightly lower than the top surfaces of said transverse support members.

4,455,926

BAKING PLATE ARRANGEMENT

Julius B. Paaskesen, Vaerlose, Denmark, assignor to J. Paaskesen og son a/s, Glostrup, Denmark

Filed Jul. 22, 1982, Ser. No. 400,845
Int. Cl.³ A47J *37/01*
U.S. Cl. 99—422 **12 Claims**

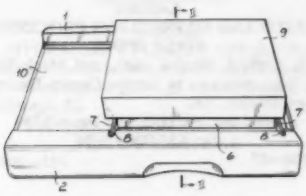


1. A baking plate arrangement comprising a frame and a plate connected thereto, characterized in that the plate (**2**, **20**) is secured to the frame (**1**) by means of rivets (**3**, **13**) extending through the plate (**2**, **20**) and the frame (**1**), each rivet hole (**4**, **14**, **24**) in the plate being of an area 1.0–4.0 times the sectional area of the rivet shank (*3a*), and that each rivet hole (**7**, **17**) in the frame (**1**) is substantially of the same area as the cross section of the rivet shank (*3a*), and that the number of rivets is relatively high when the plate rivet holes (**4**, **14**, **24**) are small, whereas the number of rivets is relatively low when the plate rivet holes (**4**, **14**, **24**) are large, a small interspace (**5**) being provided between the head (*3b*) of the rivets and the plate (**2**, **20**) when the arrangement has room temperature.

4,455,927
HEAT ACCUMULATING HOT PLATE FOR THE PREPARATION AND COOKING OF FOOD

Riccardo Schweizer, Via Roma, 41, Mezzano di Primiero (Province of Trento), Italy

Continuation of Ser. No. 137,056, Apr. 3, 1980, abandoned. This application Aug. 2, 1982, Ser. No. 404,077
Claims priority, application Italy, Apr. 6, 1979, 30679 A/79
Int. Cl.³ A47J *37/10*
U.S. Cl. 99—425 **1 Claim**



1. A plate or dish arrangement for cooking and serving food, comprising in combination:

(a) a wooden support of substantially rectangular shape having two parallel support side blocks with a lower resting surface and a board member fixed between said support side blocks parallel thereto in a position vertically distant from said lower resting surface;

(b) a metal frame having bracket formations supported on said side blocks of said wooden support to maintain said metal frame spaced from said board member to define an interspace therebetween;

(c) a slab element of substantially parallelepipedal configuration removably arranged on said metal frame such as to project upwards therefrom, the upper surface of said slab element constituting a cooking surface upon which food is to be directly laid, said slab element being formed from a stone having an isotropic crystallographic structure and high thermal capacity, said slab element being adapted to be heated in an oven before being placed for use upon said frame and

(d) a drip pan partially arranged in said interspace between said slab element and said board member, said drip pan having side wings bent for resting on said board member to maintain said pan in spaced relationship from said board member and from said slab element and the area of said pan being greater than the area of said slab element to define a tray extending laterally beyond said slab element and said interspace whereby liquids released from the food can fall from the cooking surface onto the drip pan.

4,455,928
MEANS FOR INJECTING FLUIDS INTO FOOD PRODUCTS

Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Filed Sep. 30, 1982, Ser. No. 431,216
Int. Cl.³ A23B *4/00*; A23L *1/31, 3/34*
U.S. Cl. 99—533 **27 Claims**

1. A machine for injecting fluids into food products and the like, comprising,

a support means having a conveyor means movably mounted thereon for conveying the food product from one end thereof towards the other end thereof,

a fluid manifold means movably mounted above said conveyor means and being movable between upper and lower positions with respect to the conveyor means,

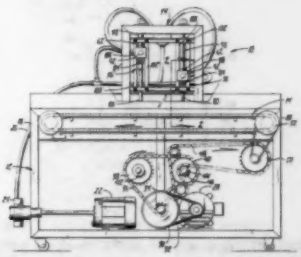
a first power means for reciprocatably moving said fluid manifold means between its upper and lower positions,

said fluid manifold means having a plurality of injecting needles extending downwardly therefrom adapted to pierce the food product thereunder when said fluid manifold means is in its said lower position,

a stripper plate means operatively connected to said fluid manifold means for movement therewith during at least the initial portion of the downward travel of said fluid manifold means, said fluid manifold means continuing to move downwardly relative to said stripper plate means to over-travel said stripper plate means after said stripper plate means has engaged the food product,

said stripper plate means including a stripper stem mounted thereon for movement therewith and extending upwardly therefrom,

said fluid manifold means including a vertically disposed bore formed therein having upper and lower end portions which slidably receive said stripper stem, said bore having a first intermediate bore portion above said lower end portion, said bore having a second intermediate bore portion above said second intermediate bore portion and having a larger diameter than said first intermediate bore portion,



said fluid manifold means having a plurality of vertically disposed needle bores formed therein,

the upper end of said needle bores being in fluid communication with said second intermediate bore portion,

said fluid manifold means having a passageway means formed therein which is in fluid communication with a source of injection fluid under pressure and with said first intermediate bore portion,

said stripper stem being movable between upper and lower positions relative to said vertically disposed bore,

means yieldably normally maintaining said stripper stem in its said lower position,

said stripper stem having a seal means mounted thereon which sealably engages the wall surface of said first intermediate bore portion, when said stripper stem is in its said lower position, to prevent injection fluid from being supplied to said needles,

said seal means being positioned on said stripper stem so that said needles will penetrate the food product a predetermined depth prior to injection fluid being supplied to said needles.

4,455,929
APPARATUS FOR LONGITUDINAL SECTIONING OF STEM TYPE VEGETABLES

Khosrow Goudarzi, 304 Peckham Rd., and Fernando I. Maltos, 231A Live Oak Rd., both of Watsonville, Calif. 95076

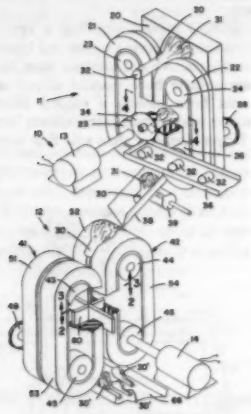
Filed Sep. 30, 1982, Ser. No. 429,801
Int. Cl.³ A23N *15/02*
U.S. Cl. 99—637 **9 Claims**

1. Apparatus for slicing stem type vegetables such as broccoli and the like into four subtantially equal longitudinal sections defining first second given planes normal to each other, said apparatus comprising:

(a) a pair of mutually opposed resilient close spaced surfaces on opposite sides of said first given plane, each of said pair of mutually opposed resilient close spaced surfaces being

divided into two closely spaced parts on opposite sides of said second given plane, said pair of mutually opposed resilient close spaced surfaces each being relieved along said second plane by providing each of said two parts thereof with a substantially flat surface extending at an included angle of about 45° with respect to said first and second planes;

(b) means for moving each part of each of said pair of mutually opposed resilient close spaced surfaces synchronously with the other parts of said pair of mutually opposed



resilient close spaced surfaces along said given planes, whereby stem type vegetables fed stem first between said pair of mutually opposed resilient close spaced surfaces will be moved by said surfaces along a path coinciding with the intersection between said first and second given planes; and

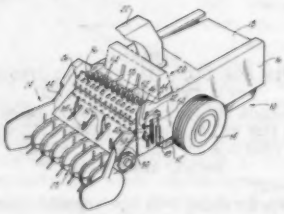
(c) knife means mounted in said first and second given planes and in said path of movement of said vegetables with the knife edge of said knife means forming the leading edge thereof with respect to said vegetables.

4,455,930

METHOD AND APPARATUS FOR DELIVERING TWINE TO A BALER KNOTTER

Alexander Crawford, Mississauga, Canada, assignor to Massey-Ferguson Industries Limited, Toronto, Canada

Continuation-in-part of Ser. No. 295,897, Aug. 24, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 419,683
Claims priority, application Canada, Mar. 23, 1982, 399213
Int. Cl.³ B65B *13/02*
U.S. Cl. 100—3 **16 Claims**



1. A method for delivering twine to a baler knotter disposed to one side of a bale chamber of a baler, the baler being of the type having feeding means for delivering fibrous material into an inlet end of the bale chamber, the feeding means including a pair of rollers which are moved back and forth across the inlet end of the bale chamber; said method comprising the steps of

supporting a portion of the twine on one of said rollers as the rollers are moved back and forth across the inlet end of the bale chamber; and

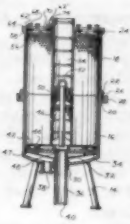
picking up said portion of the twine after the bale has been formed and bringing said portion to the baler knotter for subsequent tying and cutting.

4,455,931

APPARATUS AND METHOD FOR PROCESSING RAW FIBER STOCK

Graham F. Clifford, Stanley, N.C., and Mack W. Spurrier, Clover, S.C., assignors to Gaston County Dyeing Machine Company, Stanley, N.C.

Filed Sep. 30, 1982, Ser. No. 431,790
Int. Cl.³ B30B *9/06*
U.S. Cl. 100—37 **32 Claims**



1. An apparatus for compressing raw fiber stock in preparation for subsequent wet processing comprising a hollow container for receiving and containing fiber stock, said container having an imperforate section and a perforate section detachably joined together, said imperforate section having an open end at the juncture with said perforate section and having a closed opposite end, said perforate section having an open end at the juncture with said imperforate section to define a common interior for receipt and compression therein of raw fiber stock, said perforate section having an opening remote from said imperforate section for introduction therethrough of raw fiber stock into said container interior, a removable end cover mountable on said perforate section in covering relation over said opening, piston means reciprocably movable in said imperforate section toward and away from said perforate section between a fiber-loading position withdrawn within said perforate section and a fiber compressing position at said perforate section for compressing the fiber stock in said housing into said perforate section, closure means attachable across the open end of said perforate section at said imperforate section upon completion of compression of fiber by said piston means into said perforate section, said closure means being attachable to said perforate section independently of said imperforate section, whereby said perforate section with compressed fiber stock therewithin and with said end cover and closure means attached thereto may be separated as a unit from said imperforate section for use as a fiber-containing basket in a subsequent textile wet processing operation.

19. A method of compressing raw fiber stock in preparation for subsequent wet processing thereof, said method using a hollow container having an imperforate section and a perforate section detachably joined to form a common interior and with piston means reciprocably movable in the imperforate section toward and away from the perforate section, said method comprising joining said imperforate section and perforate section together, loading wet raw fiber stock into the common interior of the hollow container through an opening in the perforate section remote from said imperforate section, closing

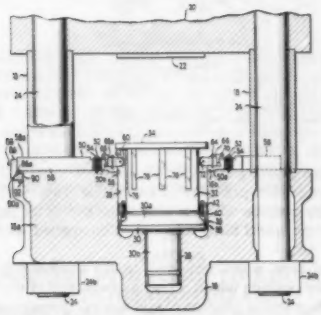
said opening, moving said piston means in said imperforate section toward said perforate section to compress the raw fiber stock into the perforate section while expelling liquid therefrom through the perforations of the perforate section, attaching closure means across the open end of the perforate section at the imperforate section to retain said compressed fiber stock in said perforate section, and removing said perforate section from said imperforate section with said closure means remaining attached to said perforate section for subsequent wet treatment of the compressed fiber stock while in said perforate section.

4,455,932

HYDRAULIC CYLINDER APPARATUS

Tsuruo Otsuka, South Holland, and Anthony A. Cristofano, Oak Lawn, both of Ill., assignors to Verson Allsteel Press Company, Chicago, Ill.

Filed Mar. 25, 1983, Ser. No. 478,719
Int. Cl.³ B30B *15/04*
U.S. Cl. 100—214 **8 Claims**



1. A hydraulic press, comprising: a bed member in the form of a hydraulic cylinder body; a crown; a stationary platen and a movable platen; a plurality of columns for supporting the crown in spaced relation to the bed member; a plurality of tie rods extending through the bed member, the columns and the crown for prestressing the press; a piston body longitudinally movably received in the cylinder body; and cylinder body and piston body prestressing means associated with the cylinder body, said prestressing means including adjustable guide means adapted to engage the piston body for applying a predetermined amount of preloading thereto to provide zero clearance for guiding the piston body, said prestressing means further including adjustable cylinder body engaging means for absorbing any deformation of the cylinder body under load, the piston engaging guide means and the cylinder body engaging means cooperating to maintain zero clearance for guiding the piston body, and to prevent any overloading of the adjustable guide means.

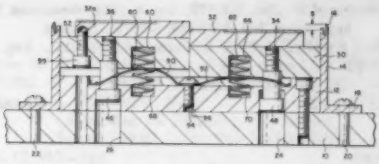
4,455,933

APPARATUS AND METHOD FOR SIMULTANEOUSLY PRINTING AND EMBOSSING PLASTIC AND SEALING AND/OR TEAR SEALING THE SAME

Arthur W. Bichsel, 505 Bay 5th St., West Islip, N.Y. 11795

Filed Jun. 11, 1982, Ser. No. 387,379
Int. Cl.³ B44B *5/02*
U.S. Cl. 101—27 **10 Claims**

1. Apparatus for simultaneously printing on plastic and embedding the printing in the plastic, said apparatus comprising a base member, a printing and embossing means relatively displaceable on said base member, first spring means between said printing and embossing means and said base member, power means to supply high-frequency heating power to said base member, said first spring means being compressible and forming a path for the power from the base member into said printing and embossing means, and second spring means between said printing and embossing means and base member and insuring the registration with an penetration of the latter into the plastic when the plastic is softened due to the application of



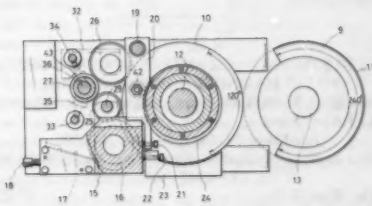
said power, said first and second means respectively urging the printing and embossing means away from the base member, the second spring means being stronger than the first spring means, said first spring means including at least one leaf spring and said second spring means including at least one helical spring.

4,455,934

COLOR HEAD FOR OFFSET PRESS

Humphrey Van Der Roer, Belfaux Fribourg, Switzerland, assignor to Fuji Kikai Kogyo Kabushiki Kaisha, Japan

Filed Sep. 17, 1982, Ser. No. 419,258
Claims priority, application Japan, Sep. 17, 1981, 56-145610
Int. Cl.³ B41F *17/18, 31/34*
U.S. Cl. 101—35 **1 Claim**

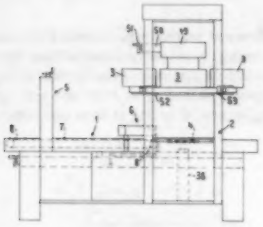


1. A color head for an offset press comprising: a plate cylinder and a form roller rotating at the same speed while in contact with each other; an ink roller rotatably supported inside an ink fountain and made to come in to and out of contact with said form roller by rocking levers; a cam ring disposed on each side of said form roller so that said fountain roller comes into contact with said form roller within a predetermined angular area of said form roller and supplies the ink to said form roller in each cycle in which one article is printed; a cam follower adapted to each said rocking levers so as to always be in contact with a respective said cam ring; said rocking levers are pivoted about an eccentric shaft for changing the time during which said fountain roller is in contact with said form roller so as to adjust the quantity of ink supplied within said predetermined angular area; two oscillating rollers adapted so as to be in contact with said form roller; and an intermediate rubber roller disposed between said oscillating rollers and in contact with them.

4,455,935
METHOD AND APPARATUS FOR PRINTING BOX-SHAPED ARTICLES WITH VERTICALLY DISPOSED PRINTING STENCILS

Kurt Manz, Uster, and Hans Umiker, Zürich, both of Switzerland, assignors to Alexander Schoeller & Co. AG, Volketswil, Switzerland

Continuation of Ser. No. 289,872, Aug. 4, 1981, abandoned. This application Jun. 15, 1983, Ser. No. 504,466
Claims priority, application European Pat. Off., Aug. 21, 1980, 80810260.2
Int. Cl.³ B41F *17/24*
U.S. Cl. 101—35 11 Claims

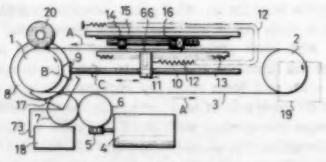


1. In a method for printing a box-shaped article at a plurality of printing stations with a printing stencil included as part of each printing station, wherein the article is transported along an unobstructed conveying path by a conveying arrangement, the improvement comprising: locating said printing stations out of the conveying path such that no portion of said printing stencils extends into said path, initially holding the article upon its arrival on said conveying arrangement by a sluice-gate, releasing the article therefrom, transporting the article by a conveyor belt to a conveyor slide, transporting the article from the conveyor slide onto a lifting platform, transporting the article to said printing stations with the lifting platform, and simultaneously printing adjacent sides of the article with said printing stencils.

4,455,936
PRINTER SYSTEM WITH ALTERNATE TYPE BELT AND PRINT HAMMER POWER CONTROL

Fumihisa Hori, Tamayama, Japan, assignor to Alps Electric Co., Ltd., Tokyo, Japan

Filed Sep. 30, 1982, Ser. No. 431,301
Claims priority, application Japan, Dec. 28, 1981, 56-209833
Int. Cl.³ B41J *1/18, 1/20*
U.S. Cl. 101—93.14 17 Claims

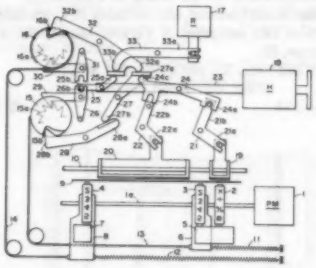


1. A printing device including an endless printing belt having a plurality of printing fonts arranged along its outer surface, means for moving said belt along an endless path of movement, means for feeding a recording paper past said endless path of movement, a hammer located within said path of movement, means for moving said hammer towards said belt to push a selected font on said belt towards said recording paper for printing thereon, and means including a clutch for selectively transmitting motive power from a single driving source to either said means moving said belt along said endless path of movement or said means moving said hammer.

4,455,937
PRINTING DEVICE

Minoru Murata, and Tsuyoshi Kawanabe, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 253,548, Apr. 13, 1981, abandoned. This application Jan. 21, 1983, Ser. No. 459,969
Claims priority, application Japan, Apr. 24, 1980, 55-55211
Int. Cl.³ B41J *9/04*
U.S. Cl. 101—93.15 3 Claims



1. A serial printing device, comprising:

a first type wheel provided on a rotatable shaft and having a standby-position which is near a first end of the shaft, said first type wheel being adapted to be applied with a first color ink;

a second type wheel provided on the shaft and having a standby-position which is near a second end of the shaft so that the standby-position of said second character wheel is different than the standby-position of said first character wheel, said second type wheel being adapted to be applied with a second color ink;

a solenoid connected to transmitting means for selectively driving along the shaft said first and said second type wheels;

means for shifting the transmitting means to selectively apply the driving power of said solenoid to one of said first and second type wheels so that the selected type wheel is driven and the non-selected type wheel remains in its standby-position; and

first and second spring means connected to said first and second type wheels, respectively, for moving said first and second type wheels in cooperation with the transmitting means.

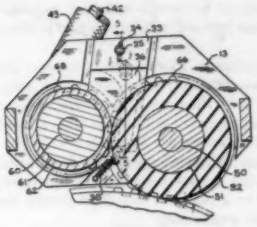
4,455,938
DAMPENING APPARATUS FOR LITHOGRAPHIC PRESS

James R. Loudon, Toledo, Ohio, assignor to Graph Tech Inc., Oakland, N.J.

Continuation-in-part of Ser. No. 294,925, Aug. 21, 1981, abandoned, and Ser. No. 183,751, Sep. 12, 1980, abandoned, each is a continuation-in-part of Ser. No. 41,527, May 22, 1979, abandoned. This application Feb. 7, 1983, Ser. No. 464,802
Int. Cl.³ B41F *31/06, 31/10*; B41L *27/08*
U.S. Cl. 101—148 14 Claims

1. A dampening apparatus for lithographic printing presses having a plate cylinder around which an offset lithographic printing plate may be mounted, a dampening form roller having an ink receptive surface and mounted parallel and contiguous to said plate cylinder along a first line of tangency, means for positively rotating said form roller in a direction counter to and at the same surface speed as said plate cylinder, a metering roller also having an ink receptive surface extending along a

second line of tangency to said form roller on the opposite side thereof from said plate cylinder, the surface of said metering roller being substantially harder than the surface of said form roller, means for rotating said metering roller counter to and at the same surface speed as said form roller, means pressing said metering roller against said form roller and means pressing said form roller against a plate on said plate cylinder such that said rollers define between them a reservoir for dampening solution to which is added ink carried back to said rollers from the



plate, whereby there exists a delivery arc on said form roller from said second to said first line of tangency measured in the direction of rotation of said form roller and an uninterrupted solution return arc on said form roller from said first to said second line of tangency in the direction of rotation of said form roller for the mixed ink and dampening solution, and a supply of dampening solution to said reservoir including means for automatically maintaining constant the dampening solution level in said reservoir.

4,455,939

IMPACT FUZE WITH FLIGHT TIME-DEPENDENT DETONATION DELAY

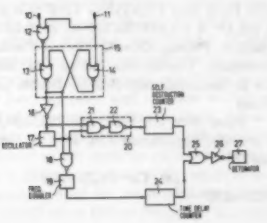
Klaus Münzel, Klingnau, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Bührle AG, Zürich, Switzerland

Filed Jan. 18, 1982, Ser. No. 340,488

Claims priority, application Switzerland, Jan. 30, 1981, 683/81

Int. Cl.³ F42C *11/06*

U.S. Cl. 102—215 **3 Claims**



1. An impact fuze for a flying object, especially for rockets or projectiles, with flight time-dependent time-delay between the moment of impact and the detonation of the rocket or the projectile, comprising:

means for measuring the flight time of the flying object;

means for measuring the time-delay between projectile impact at a target and projectile detonation;

means for adjusting said time-delay as a function of said flight time of the flying object;

said means for measuring the flight time comprising a first counter;

said means for measuring the time-delay comprising a second counter;

said adjusting means comprising a circuit for switching-over in stages said second counter to a greater time-delay as a function of said flight time determined by said first counter;

said stages being of unequal temporal magnitude; and

said temporal magnitudes increasing as the flight time of the projectile increases.

4,455,940

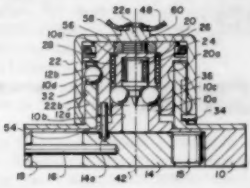
RANDOM TIME DELAY FUZE

Haruo H. Furuike, La Palma, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 28, 1982, Ser. No. 392,495

Int. Cl.³ F42B *13/50*; F42C *5/00, 15/32*

U.S. Cl. 102—228 **14 Claims**



1. A time delay fuze comprising:

a cylindrical firing pin guide having an open end;

a detonator slider including a detonator mounted adjacent to said open end of said firing pin guide;

a firing pin slidably mounted in the open end of said guide for firing said detonator;

spring means urging said firing pin toward said detonator;

means for releasably locking said firing pin to said firing pin guide;

a cylindrical cup guide means concentric with said cylindrical firing pin guide;

a cylindrical cup slidably mounted on said cup guide;

means for limiting travel of said cup on said cup guide;

a piston having an inner recess slidably mounted between said firing pin guide and said cup guide, said piston being movable in said cup to form a fluid volume space in said cup and having means for forming a unidirectional seal between the perimeter thereof and the inner wall of said cup, said seal permitting passage of fluid therethrough into said space but not in the reverse direction;

means for releasably locking said piston to said cup guide;

means defining a fluid restrictor for venting fluid from said space in a restricted manner;

biasing means connected to said piston for moving said piston to reduce the volume of said space and cause fluid in said space to move through said fluid restrictor and thereby retard movement of said piston;

whereby movement of said piston to a selected position in said cup releases said firing pin locking means.

4,455,941

DETONATING CORD AND CONTINUITY VERIFICATION SYSTEM

Richard E. Walker, 431 Sherer Blvd., Cocoa, Fla. 32922; James D. Heckelman, Old State Rd., Norwalk, Ohio 44857, and Robert A. Ziemke, 1813 Sandusky St., Sandusky, Ohio 44870

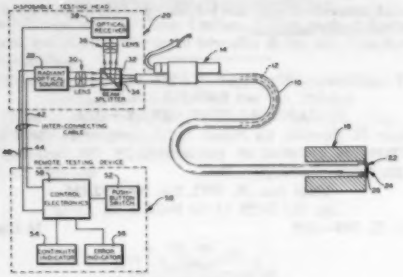
Division of Ser. No. 226,449, Jan. 19, 1981, Pat. No. 4,403,143, which is a continuation of Ser. No. 957,438, Nov. 3, 1978, abandoned. This application Jun. 3, 1983, Ser. No. 487,892

Int. Cl.³ C06C *5/04*; F42C *19/00*

U.S. Cl. 102—275.8 **9 Claims**

3. A new and improved detonating cord having spaced apart ends and comprising: a single fiber optic cord generally cen-

trally located in and surrounded by a uniform coating of an ignition conducting material, said fiber optic cord being con-



structed and arranged to conduct light between ends of said ignition conducting material.

4,455,942

TRAINING AMMUNITION

John Murray, Enfield, and Robert W. Tobias, Waltham Abbey, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Jul. 16, 1981, Ser. No. 283,916

Claims priority, application United Kingdom, Jul. 18, 1980, 8023528

Int. Cl.³ H04B 5/22

U.S. Cl. 102—444 **8 Claims**

1. A practice round of small arms ammunition of a calibre up to 10 mm for increased safety in training with an automatic firearm said round comprising a cartridge case, a quantity of propellant material means within the case, and bullet means fitted at the forward end of the case to seal the propellant material within the case, the bullet means consisting solely of a core of foamed polyurethane material and an external skin of unfoamed polyurethane, any space between the propellant material and the bullet means being entirely free from solid material, wherein on firing the round the propellant material means ignites to produce high energy gases which act directly upon the bullet means to project the bullet means from the case and to consume the bullet means when thus projected from the case.

4,455,943

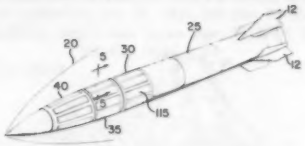
MISSILE DEPLOYMENT APPARATUS

George T. Pinson, Huntsville, Ala., assignor to The Boeing Company, Seattle, Wash.

Filed Aug. 21, 1981, Ser. No. 295,164

Int. Cl.³ F42B 15/00, 13/28, 13/50

U.S. Cl. 102—489 **19 Claims**



1. Apparatus for deploying a body from a stowed position within a moving carrier vehicle to an operative position intially parallel to a high velocity fluid stream contiguous said carrier vehicle, comprising:

a deployment assembly provided with an exterior surface covering and being attached to said vehicle, said assembly including means for ejecting at least one body, said ejection means comprising means supporting said body along a longitudinal axis that is oriented substantially parallel to said fluid stream as said body is being ejected;

means cooperating with said body support means for imparting a motion to said body substantially perpendicular to said fluid stream whereby said body may be ejected, said motion imparting means comprising a cavity, a reciprocable piston head mounted within said cavity defining an expansible chamber, a piston rod attached to said piston head and being constrained for translation along an axis substantially perpendicular to said fluid stream, said body support means being attached to said piston rod, and means for providing said chamber with an expansible fluid, and

means for holding said body support member against said exterior surface covering after said body has been deployed.

4,455,944

DEVICE FOR SEPARATING THE SOLID CHARGE RESIDUES IN A PYROTECHNIC REGULATING UNIT

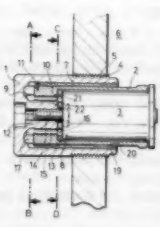
Wilfried Becker, Pöring; Oswald Pepina, Puchheim, and Manfred Landmann, Waakirchen, all of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Fed. Rep. of Germany

Filed Nov. 23, 1981, Ser. No. 324,065

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1980, 3046817

Int. Cl.³ F42B 3/04

U.S. Cl. 102—530 **7 Claims**



1. A device for separating solid residues from gases generated by a charge cartridge having a gas discharge end and used in a final pyrotechnic regulator unit comprising:

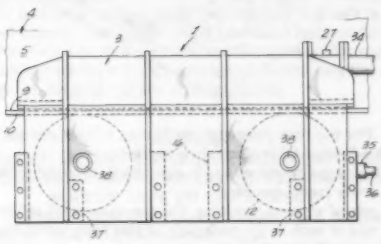
a casing having a recess in a bottom end face;
means supporting the cartridge with its gas discharge end facing and spaced from the casing bottom end to define a first passage in the casing recess;
a sleeve connected in the recess and supported between the cartridge and said casing to define a second passage communicating with said first passage and extending parallel to at least a portion of said first passage to reverse a flow direction of gases from the cartridge;
a plurality of fins extending into at least one of said first and second passages, said fins extending transversely to the flow of gases in said one of said first and second passages; and
said first and second passages both including annular sections having inner and outer bounding walls, said fins defined on said inner and outer walls of said annular sections, whereby solid residues in the gases passing through the first and second passages are separated from the gases and deposited on said walls of said first and second passages.

4,455,945

AIR BEARING POWER AND TRACTION DRIVE SYSTEM

Malte Swensson, North Hollywood, Calif., assignor to Airail Systems, Inc., Woodland Hills, Calif.

Filed Jul. 6, 1982, Ser. No. 394,900
Int. Cl.³ B61B *13/08*
U.S. Cl. 104—23 FS **6 Claims**



1. A high pressure-low displacement air bearing truck for supporting a fully loaded vehicle for operation on a relatively flat traversing support member, and capable of automatically accommodating varying loads instantaneously and functioning in conjunction with power sources supplying required compressed air for load support, and traction including adaptive use of fossil fuel engines, electric motors, linear induction motors, and other power sources with each truck comprising:
a. two plenum chamber systems each providing high pressure air to a traversing plane of the support member;
b. a high pressure seal for each plenum chamber which enables control of a lifting force by a compressed air release rate from the plenum chamber;
c. at least two wheels with pneumatic tires, axles and power drive shaft mounted in the lower portion of the truck which functions to:
1. act as an equal and opposite force against a lower side of a traversing support member to that of the compressed air force on an upper side of the traversing support member;
2. supply a stabilizing mechanism with an equal and opposite force for automatically counteracting:
(a) the lifting forces induced by the compressed air in the plenum chamber against an upper traversing surface;
(b) a lift induced by aero dynamic forces upon a transporting vehicle;
(c) acceleration forces induced by deviations in a traversing structure;
(d) a centrifugal force induced by turning and banking of a transporting vehicle;
(e) eccentric loads caused by load distribution;
3. Provide tractive forces against a lower traversing surface;
4. provide a dampening effect on the aforementioned forces imposed;
d. the several parts of the truck creating an Air Motive Clamp to the traversing support member thereby inducing a controlled attitude of the truck with respect to the traversing surface while in motion, including acceleration and deceleceration, and a positive Motive Clamp for emergency travel speed, and a positive static clamp when stationary;
e. truck operating control system providing a closed loop servo system for detecting system variations enabling instantaneous automatic controlled response to the functional elements, and comprising:
A. functional elements including:
(1) two pressure regulator units to provide a proper air pressure to the plenum chambers and high pressure air seals;
(2) two air flow meter units to provide the proper flow of air into the plenum chambers and high pressure seals;
(3) at least two temperature control units to maintain a proper seal temperature;
(4) a servo amplifier to receive function variations from sensors and required correctional signals and to transmit corrective action to a proper control unit;
(5) servo amplifier power supply to supply power for a corrective action of the other functional elements;
B. operation monitoring elements including:
(1) air pressure sensors in the plenum chambers to indicate the pressure within the chamber;
(2) proximity sensors to indicate the vertical attitude of the air bearing truck with respect to the traversing plane;
(3) heat sensors to indicate the temperature of the high pressure air bearing seal;
f. four cylinders in each plenum chamber to provide distribution of the compressed air to the traversing plane;
g. a sleeve is provided in each cylinder which is automatically located in a nonfunctioning position during normal operation, and functions during emergency conditions at which time it is driven automatically due to a pressure differential between upper and lower portions of the plenum chambers to the traversing plane and becomes an alternate floating seal;
h. four support pads, two at each end of the truck assembly, which are utilized:
(1) as a support for the vehicle in stationary position;
(2) as a seal deflection limiter due to irregularities of the traversing plane;
(3) as a low friction positive support for emergency travel when there is no compressed air available;
(4) as a deflector of extraneous rubble on the traversing plane;
(5) as an emergency brake.

4,455,946

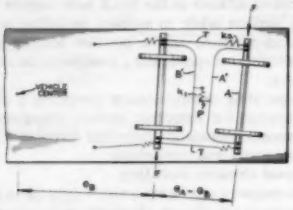
ARTICULATED TRUCKS

Harold A. List, Bethlehem, Pa., assignor to Railway Engineering Associates, Inc., Bethlehem, Pa.

Continuation-in-part of Ser. No. 608,596, Aug. 28, 1975, Pat. No. 4,131,069, which is a continuation-in-part of Ser. No. 438,334, Jan. 31, 1974, abandoned. This application Oct. 5, 1978, Ser. No. 948,878
Int. Cl.³ B61F *3/08, 5/38, 5/52*
U.S. Cl. 105—168 **17 Claims**

1. A vehicle truck assembly, comprising: main truck framing including bolster means for load-bearing association with a wheeled vehicle, and a pair of side frame members each associated with a corresponding end portion of said bolster means to receive load therefrom, and each having means defining a pair

of pedestal members for loadimposing cooperation with outboard axle portions of a wheelset; bearing means for each outboard axle portion, each such bearing means being in load-carrying association with a corresponding pedestal member; a pair of steering arm means each having spaced portions connected to corresponding bearing means, whereby each carries an axle-borne wheelset, and each steering arm means having structure extending into a region between the two axles; means



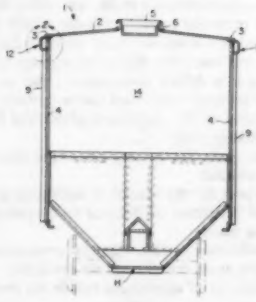
in said region extending through an opening through said bolster means and pivotally interconnecting the steering arm structures independently of yaw-inducing connection with said bolster means; and resilient means interposed between the bearing means of at least one axle and its corresponding pedestal members, said resilient means being of stiffness sufficient resiliently to oppose departure of said pivotally connected steering arm means from positions in which the wheelsets are parallel.

4,455,947

COVERED HOPPER CAR

John C. Reeve, Lawrenceville, and Howard C. Woodman, Roswell, both of Ga., assignors to Portec, Inc., Oak Brook, Ill.

Filed Jan. 20, 1982, Ser. No. 340,849
Int. Cl.³ B61D *7/00, 17/16, 39/00*
U.S. Cl. 105—377 **2 Claims**



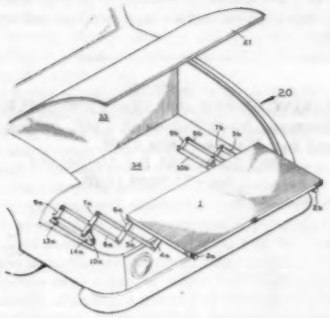
1. A covered hopper car including, substantially vertically disposed side sheets each having a top portion, a roof sheet provided with centrally disposed hatch openings, said roof sheet extending outwardly and downwardly from said hatch openings and having opposite lateral edges spaced above and adjacent said side sheet top portions, a single member top chord spanning each spaced apart side sheet and roof sheet edge, each said top chord comprising an inside wall joined to one said side sheet top portion, a bottom wall connected to said inside wall, an outside wall extending upwardly from said bottom wall, a planar top wall connected to said outside wall and inclined inwardly and upwardly to provide a planar upper surface, said top wall having a free edge disposed within the car interior beyond the vertical plane of said chord inside wall and said side sheet, said roof sheet comprising a planar member disposed at an inclination comparable to the inclination of said planar top chord top wall, said top chord comprising a tube member formed of unitary stock having three rounded corners and defining a closed internal cavity, vertical side posts joined to said side sheets and abutting said top chord bottom walls, said side posts fully disposed beneath said top chord bottom walls, said roof sheet having a planar undersurface, said roof sheet lateral edge substantially overlying said top chord top wall upper surface with a portion of said undersurface flushly engaging said chord top wall upper surface, and a disparate lining of plastics composition covering the interior of said roof sheet, top chord and side sheet.

4,455,948

AUTOMOTIVE TRUNK TABLE

Israel Torres, Ave. Amalia Paoli SE-25, Levittville, Levittown, P.R. 00632

Filed Jun. 14, 1982, Ser. No. 387,934
Int. Cl.³ A47B *23/00*
U.S. Cl. 108—44 **5 Claims**



1. For use on a passenger car having a trunk compartment with a floor, a table assembly comprising:

a table top dimensioned to be completely received inside said trunk compartment;

a pair of pivoted lazy tong linkages connected at the back end of each to the underside of said table top at laterally spaced locations thereon;

and a respective mounting member at the front end of each lazy tong linkage for attachment to the floor of the trunk compartment;

said lazy tong linkages being pivotally adjustable to a collapsed position holding said table top inside said trunk compartment or to an extended position holding said table top in a horizontal position to the rear of said trunk compartment.

4,455,949

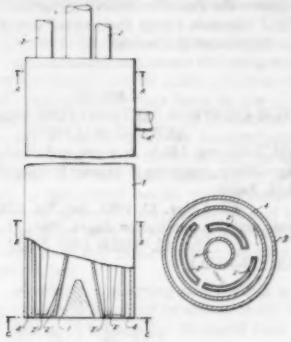
BURNER FOR GASIFICATION OF POWDERY FUELS

Horst Kretschmer; Klaus Fleischer; Peter Göhler; Manfred Schingnitz, all of Freiburg; Friedrich Berger, Brand-Erbisdorf, all of German Democratic Rep.; Aleksander Jegorow, Moskwa, U.S.S.R.; Vasilij Fedotov, Moskwa, U.S.S.R.; Vladimir Gavrilin, Moskwa, U.S.S.R.; Ernest Gudymov, Moskwa, U.S.S.R.; Vladimir Semenov, Moskwa, U.S.S.R.; Igol Achmatov, Moskwa, U.S.S.R.; Nikolaj Majdurov, Moskovsk, U.S.S.R., and Evgenij Avraamov, Moskwa, U.S.S.R., assignors to Brennstoffinstitut Freiberg, Freiberg, German Democratic Rep.

Filed Feb. 13, 1980, Ser. No. 121,254
Int. Cl.³ F23D *1/00*
U.S. Cl. 110—263 **2 Claims**

1. A burner for use in a reactor for gasification of powderized fuel, comprising: a burner housing enclosing a central tubular channel; a coaxially arranged boundary annular channel; at least one intermediate channel in the form of at least annular section arranged concentrically between said tubular channel and said boundary annular channel; first conduit

means communicating with said central tubular channel and said boundary annular channel for introducing streams of carburation fluid therein; second conduit means including at least one tubular conduit communicating with said one intermediate annular section and having a transition portion of a successively different outline of its cross-section enclosing at any successive point the same area as that of said tubular con-



duit; said first inlet conduit means including an axial inlet conduit connected to said central tubular channel and a lateral inlet conduit connected to said boundary annular channel; and further including at least three intermediate channels in the form of annular sections of the same radii and being uniformly distributed on a circle and each communicating with a vertical inlet conduit having a circular cross-section enclosing the same area as the assigned annular section channel.

4,455,950

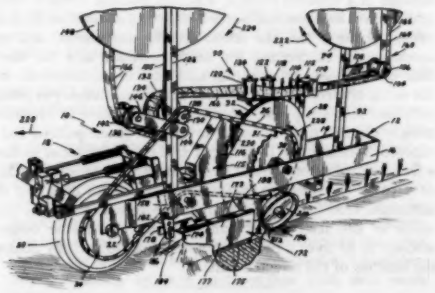
TRANSPLANTING APPARATUS UTILIZING A DISC MECHANISM FOR TRANSFERRING PLANTS FROM A SUPPLY TAPE TO THE FURROW

Paul R. Pretzer, Brooklyn Heights Village, Ohio, assignor to General Mills, Inc., Minneapolis, Minn.

Continuation of Ser. No. 826,808, Aug. 22, 1977, abandoned. This application Dec. 26, 1978, Ser. No. 972,809

Int. Cl.³ A01C *11/02*; A01G *23/04*

U.S. Cl. 111—2 **4 Claims**



1. Transplanting apparatus comprising a mobile frame adapted to traverse a strip of soil to be planted, means mounted on said frame for forming a furrow, first and second discs rotatably carried on said frame to the rear of said means for forming a furrow, said second disc having at least an annular flexible portion adjacent its periphery, means on said frame for rotating said discs in unison about a generally horizontal axis, means forming a V-shaped opening between said first and second discs at an upper angular location, said V-shaped opening when viewed from above having a closed end in the direction said discs rotate, a tape including a flexible backing strip and a series of resilient blocks on said strip forming slits for holding the plants to be transplanted, means for pulling a longitudinal section of said tape in the direction said discs rotate past said upper angular location with said blocks and slits generally vertical and parallel to each other for successively introducing a portion of said plants into the larger end of said V-shaped opening and advancing said plant portions in a straight line toward the closed end of said V-shaped opening, means for changing the direction of tape travel at an elevation directly above the closed end of said V-shaped opening to release said plants at the closed end of said V-shaped opening for immediate gripping thereof by the annular portions of said discs that are at that time forming the closed end of said V-shaped opening for transfer to a lower angular location, and means forming a second V-shaped opening between said first and second discs at said lower angular location for releasing said plants at said lower angular location into the furrow formed by said furrow-forming means, said transplanting apparatus including a ground-engaging wheel for supporting the forward end of said frame, a drive sprocket associated with said ground-engaging wheel, a driven sprocket associated with said discs, a chain entrained about said sprockets for causing said discs to rotate at a speed corresponding to the forward speed of said apparatus, a removable sprocket about which said chain is entrained, said tape means being driven by said removable sprocket, whereby different size sprockets can be substituted for said removable sprocket to change the speed at which the tape is pulled and hence to change the rate at which said slits open above the closed end of said V-shaped opening and hence the rate at which said plants enter said V-shaped opening with the result that plants can be deposited in said furrow at selected spacings determined by the size of said removable sprocket.

4,455,951

EMBROIDERY LACE MACHINE DRIVEN BY ELECTRIC SIGNALS

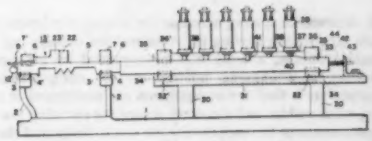
Hiroshi Nasu, Kawagoeshi, Japan, assignor to Hiraoka Kogyo Kabushiki Kaisha, Hannoshi, Japan

Filed Jul. 7, 1983, Ser. No. 511,474

Claims priority, application Japan, Sep. 8, 1982, 57-155204

Int. Cl.³ D05C *5/02*

U.S. Cl. 112—84 **5 Claims**



1. An embroidery lace machine driven by electric signals, comprising:

a frame;

a plurality of parallel selection plates mounted on said frame, each of said selection plates being horizontally movable on said frame in a first direction between a first position and a second position for controlling a jacquard;

selection plate control means associated with each said selection plate, each said control means being constructed and positioned for selectively moving one of said selection plates from said first position to said second position;

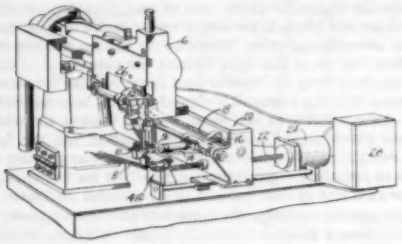
a solenoid mounted on said frame for each said selection plate, each said solenoid being selectively engageable with one of said selection plate control means for selectively actuating selected ones of said control means; and

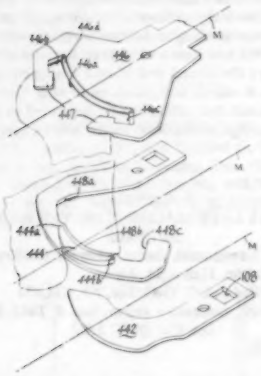
a reset bar associated with said frame at a first end of said selection plates and horizontally movable for moving all of said plates which are in said second position to said first position.

4,455,952
AUTOMATIC SEWING MACHINE

Pierre Morin, Soisy-sours-Montmorency, and Christian Thirion, Pont-Sainte-Maxence, both of France, assignors to USM Corporation, Farmington, Conn.

Filed Aug. 5, 1983, Ser. No. 520,732
Claims priority, application France, Aug. 13, 1982, 82 14106
Int. Cl.³ D05B *21/00*
U.S. Cl. 112—121.12 **14 Claims**





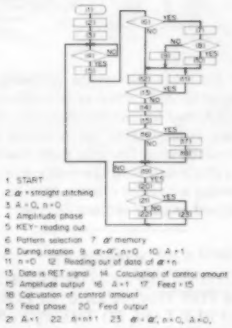
1. Automatic sewing machine for joining workpiece components comprising sewing instrumentalities comprising a reciprocating needle, a work clamp supported by a support and allowing a workpiece having several components to be clamped such that the components a.e positioned in overlapping relationship, and a control means for ensuring the relative displacement of the support for the work clamp and the sewing instrumentalities in such a manner that a joining operation may be effected progressively along a desired path on a workpiece clamped by the work clamp, said work clamp comprising three elements, one element being fixed on the support and the others being movable relative to the fixed element, the arrangement being such that, when the elements of the work clamp are closed, the workpiece components placed therebetween as aforesaid are clamped near the region of overlap between the workpiece components, at opposite sides of the path along which the joining operation is to be effected, the passage of the reciprocating needle being however allowed in this region, the first and second of the three elements having respectively first and second abutments enabling the first and second components of a workpiece respectively to be positioned in overlapping relationship and in that the second and third elements clamp the first workpiece component while it is positioned by the first abutments, and the first and third elements clamp the second workpiece component while it is positioned by the second abutments by closing the movable elements against the fixed element of the work clamp.

10. A work clamp for use in an automatic sewing machine, said work clamp being operative to clamp at least two components of a workpiece in an overlapping relationship, said work clamp comprising three elements wherein the first and second of the three elements have respectively first and second abutments enabling a first and a second component of a workpiece to be positioned in overlapping relationship and wherein the second and third elements clamp the first workpiece component against the first abutments and further wherein the first and third elements clamp the second workpiece component against the second abutments.

4,455,953
STITCH CONTROL METHOD FOR AN ELECTRONIC SEWING MACHINE

Hideaki Takenoya; Mikio Inamori, and Eiichi Shomura, all of Tokyo, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan

Filed Nov. 23, 1981, Ser. No. 323,912
Claims priority, application Japan, Nov. 21, 1980, 55-163379
Int. Cl.³ D05B *3/02, 27/22*
U.S. Cl. 112—262.1 **1 Claim**



1. START
2. α = straight stitching
3. A = CL, n = 0
4. Amplitude phase
5. KEY- reading out
6. Pattern selection 7. α memory
8. During rotation 9. $\alpha = \alpha'$, n = 0 10. A = 1
11. n = 0 12. Reading out of data of α + n
13. Data is RET signal 14. Calculation of control amount
15. Amplitude output 16. A = 1 17. Feed = 15
18. Calculation of control amount
19. Feed phase 20. Feed output
21. A = 1 22. A = n + 1 23. $\alpha = \alpha'$, n = 0, A = 0,

1. In a stitch control method in operation of a sewing machine of the type having stitch forming instrumentalities, a microcomputer having an electronic memory storing stitch control signals including data for controlling a needle position and a fabric feed of the sewing machine to produce a series of stitches of a selected pattern, a needle position control motor and a fabric feed control motor which respectively control the needle position and the fabric feeding movement, said microcomputer controlling the needle position and the fabric feed control motors such that said microcomputer reads out the stitch control signals from the electronic memory at predetermined rotation phases of the sewing machine to programmingly control the stitches of a selected stitch pattern and a repeated formation of the pattern, said microcomputer seeking a feed control amount from a predetermined intermediate data of a value between the maximum feed control data and the minimum feed control data upon identification of the total value of the feed control amount and the needle control amount to be over a predetermined value, to thereby control the stitches of the selected pattern.

4,455,954
LATERAL POSITION ADJUSTER FOR EDGE MARGIN OF LONGITUDINALLY CONVEYED FLEXIBLE MATERIAL

William F. Franck, III, and Bobby J. Cooke, both of Martinsville, Va., assignors to Tultex Corp., Martinsville, Va.

Filed Dec. 14, 1982, Ser. No. 449,643
Int. Cl.³ D05B *97/00, 35/10, 27/00*
U.S. Cl. 112—262.3 **14 Claims**

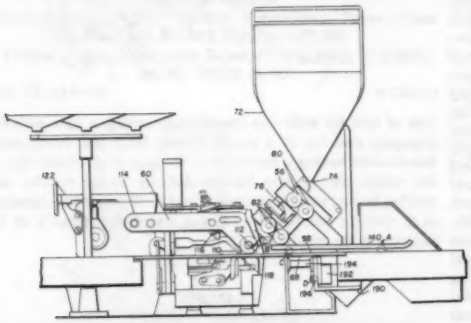
1. For use in conjunction with a conveyor having a gener-

ally horizontal, upwardly facing, longitudinal run along which at least one body of flexible sheet-like material having an edge extending generally longitudinally of the conveyor run is to be conveyed through a work station juxtaposed with the conveyor run at a site, which work station includes a work head in an instance wherein it is important that as the body passes through the work station, the margin of said edge be disposed in a predetermined laterally uniform juxtaposition with said work head,

a lateral position adjuster for the body, comprising:

pressurized air outlet nozzle means; means mounting said air outlet nozzle means so that said air outlet nozzle means is aimed generally vertically but may have its aim shifted generally angularly about a generally horizontal axis which is arranged to extend generally longitudinally of said conveyor run; and motor means for shifting the aim of said nozzle means about said axis; means for supplying pressurized air to said outlet nozzle means; means for sensing whether as successive increments of said body approach the site of the work station such edge margin is laterally deviated from said predetermined laterally uniform juxtaposition; and

control means operatively connecting said sensing means with said motor means so that as an increment of said body of material is sensed to be laterally displaced from said predetermined laterally uniform juxtaposition, said motor means is operated to angulate said nozzle means in a remedial sense, so that as pressurized air issues from said nozzle means at a lateral angle towards the respective increment



of said body of material, said edge margin of said increment of said body of material is shifted laterally towards said predetermined laterally uniform juxtaposition.

11. A method for laterally adjusting the edge margin of longitudinally conveyed flexible material, comprising:

longitudinally conveying at least one body of flexible, sheet-like material, along a generally horizontally, upwardly facing, longitudinally extending conveyor run through a work station juxtaposed with a site on the conveyor run, where each said body includes an edge extending generally longitudinally of the conveyor run and where the work station includes a work head, in an instance wherein it is important that as each body passes through the work station, the margin of said edge be disposed in a predetermined laterally uniform juxtaposition with said work head;

sensing whether as successive increments of said at least one body approach said site of said work station the respective body edge margin is laterally deviated from said predetermined laterally uniform disposition; and

blowing a stream of pressurized air from an air nozzle aimed generally vertically toward the edge margin of the at least one body immediately upstream of the work head, with said air nozzle being more particularly aimed angularly about a horizontal axis extending longitudinally of said conveyor run, in response to said sensing, so as to direct said air stream at said edge margin in such a sense as to laterally adjust said edge margin towards accomplishment of said predetermined laterally uniform disposition.

4,455,955

ACCESSORY DEVICE FOR USE ON A SEWING MACHINE

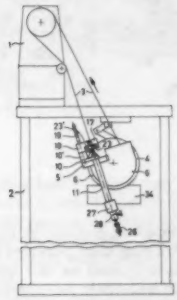
Erich Jentschmann, Itenhardstrasse 23b, CH-5620 Bremgarten, Switzerland

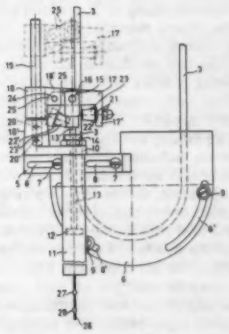
Filed Jul. 22, 1981, Ser. No. 286,103

Claims priority, application Switzerland, Aug. 7, 1980, 5984/80

Int. Cl.³ D05B 69/22

U.S. Cl. 112—274 **13 Claims**





1. In a sewing machine having a movable foot, a positioning motor, and a drive belt between the motor and sewing machine, an improvement which comprises:

(a) reciprocating means mounted adjacent said drive belt and aligned to reciprocate in a path parallel to said belt, said reciprocating means comprising longitudinal guide means, entrainer means adapted to reciprocate longitudinally along said guide means adjacent said belt, and drive means for moving said entrainer means along its reciprocal path,

(b) belt engagement means mounted on said entrainer means, said engagement means comprising brake jaw means mounted on either side of said belt, said brake jaw means adapted to engage said belt in response to movement of said entrainer means along one direction of its reciprocating path, and

(c) control means for energizing said drive means after said motor has reached a predetermined stop position.

4,455,956

CYCLIC SEWING MACHINE

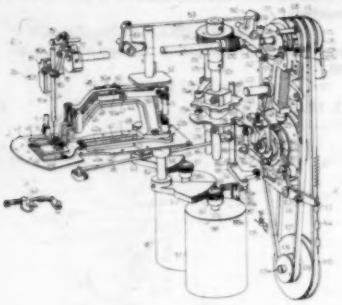
Yoshikazu Yamamoto, Inuyama; Kohzoh Sano, Toyota; Kunio Haneda, Kasugai, and Toshiaki Yanagi, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Sep. 8, 1981, Ser. No. 300,465

Claims priority, application Japan, Sep. 18, 1980, 55-129975

Int. Cl.³ D05B *69/22*

U.S. Cl. 112—274 **10 Claims**



1. A sewing machine comprising; a frame including a work supporting bed, a main shaft journaled in said frame, a reciprocateable needle supported on said frame and movably connected with said main shaft, drive means for driving said main shaft, a motion control mechanism provided between said main shaft and said drive means for controlling the start and stop of said main shaft, cam means rotatably mounted on said frame and drivingly connected with said main shaft for controlling the operation of said motion control mechanism at the sewing cycle corresponding to a predetermined number of stitches, actuating means provided between said main shaft and said motion control mechanism for effecting the operation of said motion control mechanism according to the rotation of said cam means, a work holder movably supported on said work supporting bed across the reciprocating path of said needle, feed drive means for driving said work holder, memory means having a plurality of original instructions, each of said original instructions including positional data representing the moving position of said work holder and operational command for said actuating means, means for preparing at least one additional instruction corresponding to the number of stitches required to reach the next stop time point controlled by said cam means in case that the number of stitches corresponding to said original instructions are not consistent with a number of stitches equal to an integral multiple of said predetermined number of stitches, said at least one additional instruction including positional data representing the moving position of said work holder and operational command for said actuating means, and control means for operating said actuating means and said feed drive means according to said original instructions and said at least one additional instruction.

4,455,957

THREAD CUTTER FOR A ZIG-ZAG SEWING MACHINE

Kurt Vollmar, Weilerbach, Fed. Rep. of Germany, assignor to Pfaff Industriemaschinen GmbH, Fed. Rep. of Germany

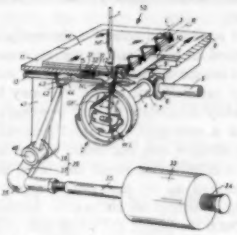
Filed Jun. 8, 1982, Ser. No. 386,305

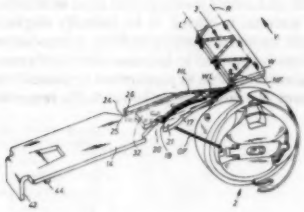
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1981, 3124795

Int. Cl.³ D05B *65/02*

U.S. Cl. 112—292 **8 Claims**

1. A thread cutter for a zig-zag sewing machine having a needle which swings transversely to the material feed direction to form a zig-zag seam of predetermined width while the needle reciprocates to pierce the material to be sewn in cooperation with a revolving looper as the material is moved transversely to the swing direction and the looper revolves in a plane perpendicular to the feed direction, comprising a cutting knife disposed adjacent to said needle, and a thread catcher movable in directions of movement of the needle toward and away from engagement with said cutting knife, said catcher having one end terminating in a tip and a lateral edge on each





side of said tip with one lateral edge having a first barb for engaging one leg of a needle thread loop and an opposite lateral edge having a second barb for engaging another leg of the needle thread loop leading directly to the needle, said catcher being movable to engage said knife to cut the thread so as to obtain a free length of thread ends independently of the position of the needle.

4,455,958

DRILLSHIP CANOPY

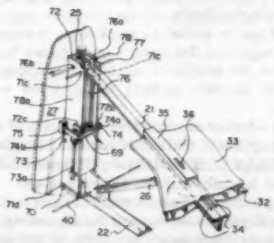
J. Cam O'Rourke; Robert E. Marshall, both of Calgary; Frank G. Bercha, Cochrane, and G. Roger Pilkington, Calgary, all of Canada, assignors to Dome Petroleum Limited, Calgary, Canada

Continuation-in-part of Ser. No. 111,394, Jan. 11, 1980, abandoned. This application Feb. 11, 1982, Ser. No. 347,923

Claims priority, application Canada, Aug. 30, 1979, 334743

Int. Cl.³ B63B *35/08*

U.S. Cl. 114—40 **11 Claims**



1. A canopy system for deployment around the periphery of a vessel floating on a body of water, comprising:

(a) a plurality of spaced-apart, structural frames extending outwardly from an inboard end to an outboard free end, each of said frames being movable between a first position in which the outer edge thereof projects to a point adjacent to the surface of said body of water on which said vessel is floating, and a second position in which said outer edge projects below said surface of the water on which said vessel is floating;

(b) release means for a two-phase releasable securing of the inboard end of said frames to the periphery of said vessel, said release means including first and second phase release members, said first phase release member being actuatable to allow said frames to move from said first position to said second position, and said second phase release member being actuatable to allow said frames to be jettisoned from said vessel;

(c) an outer stressed skin supported by, and tensioned over, the outer surface of said frames;

(d) an inner skin supported by said outer stressed skin;

(e) a skirt depending downwardly from the outboard free end of said frames, and projecting below said surface of said water on which said vessel is floating when said frames are in either their first or second positions; and

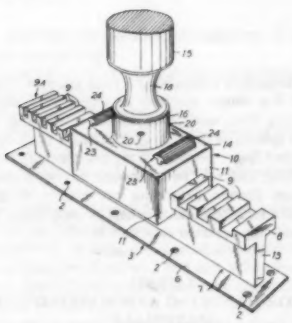
(f) a plurality of ducts for supplying heated air to the said skirt.

4,455,959

APPARATUS FOR SUPPORTING THE MAST OF A SAILING BOARD

Haruhide Suzuki, 8-26-3 Todoroki, Setagaya-ku, Tokyo, Japan

Filed Aug. 6, 1982, Ser. No. 405,891
Claims priority, application Japan, Nov. 9, 1981, 56-178452
Int. Cl.³ B63B *15/00*
U.S. Cl. 114—90 **6 Claims**



1. In a support for the mast of a sailing board of the type including guide means fixedly attachable to a top frame of the sailing board, mast mounting means movable longitudinally of the guide means, and engagement means of said guide means and said mast mounting means for locating said mast mounting means in a desired position longitudinally of said guide means:

the improvement comprising means preventing unintended release of said engagement means, and which comprise;

inter-engaging surfaces of said guide means and said mast mounting means for limiting movement of said mast mounting means to movement substantially exclusively longitudinally of said guide means and inhibiting movement of said mast mounting means in all directions transverse to said guide means;

manually operable engagement means carried by said mast mounting means and engagable within recesses in said guide means to lock said mast mounting means against displacement longitudinally of said guide means; and,

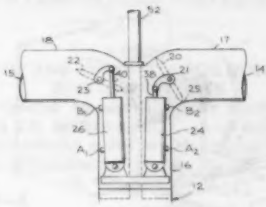
means resiliently biasing said engagement means of said manually operable engagement means into locking engagement with said recesses in said guide means.

4,455,960

FLUID VALVE ACTUATED BOAT THRUSTER

Charles M. Aker, Newport Beach, Calif., assignor to Omnithruster, Inc., Santa Fe Springs, Calif.

Filed Nov. 10, 1981, Ser. No. 319,927
Int. Cl.³ B63H *25/46*
U.S. Cl. 114—151 **4 Claims**



1. In combination with a boat having a hull, a thruster system including pump means mounted in said hull for pumping water, a common passage connected to said pump means and to first and second outlet means opening to the sea on either side of said hull for discharging water into the sea thereat, the improvement comprising:

a first vane means mounted in said first outlet means for movement between a fully open and fully closed position respectively permitting or prohibiting water flow through said first outlet means;

a first actuator coupled to said first vane means actuatable to independently force said first vane means to either said open or closed position;

a second vane means mounted in said second outlet means for movement between a fully open and fully closed position respectively permitting or prohibiting water flow through said second outlet means;

a second actuator coupled to said second vane means actuatable to independently force said second vane means to either said open or closed position;

control means for selectively establishing mutually exclusive first, second, and third states, said control means including means for selectively switching from any one state to any other state and for compelling the establishment of said third state during switching from said first to said second state and during switching from said second to said first state;

means responsive to said first state for causing said first actuator to force said first vane means to said fully closed position and said second actuator to force said second vane means to said fully open position;

means responsive to said second state for causing said second actuator to force said second vane means to said fully closed position and said first actuator to force said first vane means to said fully open position; and

means responsive to said third state for causing said first and second actuators to respectively force said first and second vane means to said fully open position.

4,455,961

OVERBOARDING FIXTURE

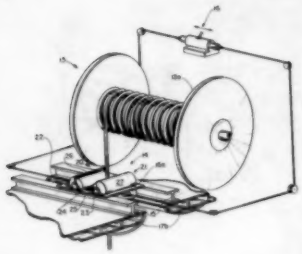
Charles E. Hansen, Alpine, and Paul A. Hanson, La Mesa, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 25, 1982, Ser. No. 391,900
Int. Cl.³ B63B *21/16*
U.S. Cl. 114—254 **4 Claims**

1. In an apparatus for the overboard launching and recover-

ing of an elongate instrumentation array and towing cable from a winch reel, an improvement therefor is provided comprising:

means disposed adjacent the winch reel for providing a fairlead for the elongate instrumentation array and towing cable having first bearing surfaces spaced apart to receive the towing cable therebetween and fabricated to present an abrasion-resistant surface to the towing cable and second bearing surfaces spaced apart to receive the elongate instrumentation array and fabricated to present a smooth



protuberance-free surface to accommodate the elongate instrumentation array, the first bearing surfaces and second bearing surfaces of the fairlead providing means are orthogonally disposed with respect to the winch reel to reduce bending of the towing cable and elongate instrumentation array and the second bearing surfaces are elongate rounded surfaces and the first bearing surfaces are elongate rounded surfaces located coaxially outwardly from the second bearing surfaces and are rotatably mounted to selectably expose the second bearing surfaces.

4,455,962

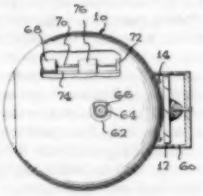
SPHERICAL UNDERWATER VEHICLE

Calvin A. Gongwer, Glendora, Calif., assignor to The Bendix Corporation, Southfield, Mich.

Continuation-in-part of Ser. No. 187,923, Sep. 17, 1980, Pat. No. 4,377,982, which is a continuation of Ser. No. 883,775, Mar. 6, 1978, abandoned. This application Mar. 8, 1983, Ser. No. 463,434

Int. Cl.³ B63G *8/08, 8/16, 8/24*

U.S. Cl. 114—312 **6 Claims**



1. A self-propelled spherical vehicle for operation in a fluid medium comprising a generally spherical housing and an impeller external of said housing, an energy source and power means in said housing connected to cause rotation of said impeller, said impeller being at the rear of said vehicle with respect to its direction of motion, characterized in that said impeller is of the actuator disk type, is adjacent said housing and approximately half the diameter of said housing and spaced such that the distance of the propeller tips from the surface of the housing is approximately 7% of the diameter of said spherical housing such that it inducts a substantial part of the boundary layer at the rear of the vehicle to thereby reduce the drag on the vehicle caused by separation of the fluid over its surface, said housing and said impeller substantially defining the configuration of said vehicle,

means carried by said housing for effecting steering thereof, including at least one fluid-deflecting device located aft of the circle of maximum diameter of said spherical housing with respect to its direction of motion, said devices being controllable to deflect a portion of the fluid adjacent the surface of said vehicle,

and a generally cylindrical shroud fastened to said vehicle along to axis of said impeller, said shroud including a cylindrical member surrounding and spaced from said impeller, said shroud having significant weight such that, upon launching of said vehicle, it is caused to make initial contact with said fluid medium and causes said vehicle to sink to a desired depth in said medium after which said power means is energized and said shroud is jettisoned.

4,455,963

HAND SIMULATOR

Masayuki Matsuo, No. 4-21-3, Gyotoku-Ekimae, Chiba-shi, Chiba-Prefecture, Japan

Filed May 19, 1982, Ser. No. 379,967

Claims priority, application Japan, Mar. 1, 1982, 57-28721[U]

Int. Cl.³ G09F *9/00*

U.S. Cl. 116—306 **9 Claims**

1. A hand simulator comprising a palm portion of cushiony material and five finger portions of cushiony material integrally extending from said palm portion and being normally extended and spaced at their finger tips from each other, said palm portion and finger portions being substantially larger than any human hand, and said palm portion having a plurality of holes provided therein extending completely through the thickness of the hand simulator whereby said finger portions are to be selectively inserted into said holes.

4,455,964

MOUNT FOR HANDLING AND MASKING OPTICAL MATERIALS

Hermann Weber, Tarzana, Calif., assignor to Techsight Corporation, Wilmington, Del.

Filed Feb. 1, 1982, Ser. No. 344,491

Int. Cl.³ B05C *13/02*

U.S. Cl. 118—500 **1 Claim**

1. A mount for handling and conveying optical material and

preventing the deposition of a coating on at least one surface of said optical material, comprising:

an overcap sealably covering an exposed surface of said material, said overcap comprising a generally circular surface, and a lip portion which sealably surrounds the circumference of said material;

a hanging means for suspending said optical material, comprising:

an elastic band circumferentially surrounding said overcap;

a lower engagement portion disposed between said overcap and said band; and

an upper engagement portion attached to said lower portion for suspending and conveying said material.

4,455,965

AUTOMATIC PROCESS AND SYSTEM FOR PAINTING MOTOR VEHICLE INTERIORS

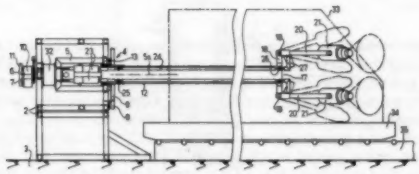
Jean Jung, Montrouge; Pierre Gourdou, Paris, and Yvon Jacob, Droue sur Drouette, all of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jan. 25, 1983, Ser. No. 460,948

Claims priority, application France, Feb. 26, 1982, 82 03293

Int. Cl.³ B05B *3/12, 5/02, 13/06*

U.S. Cl. 118—622 **4 Claims**



1. An apparatus for painting the interiors of vehicle body enclosures, comprising:

first means for supporting a vehicle and moving said vehicle along a first axis;

two electrostatic paint sprayers;

second means for supporting said sprayers along a second axis transverse to said first axis;

third means for varying the relative mutual positions of said sprayers;

fourth means for varying the distance of said sprayers relative to said first axis; and

fifth means for varying the angular circumferential position of said sprayers about said first axis, whereby said sprayers may be positioned so as to paint the entire interior of said vehicle,

wherein said second means comprises a fixed support;

said fifth means comprises a cradle mounted on said fixed support for rotation about said first axis;

said fourth means comprise a box beam pivotally mounted on said cradle about a third axis transverse to said first and second axes, and means for controlling the angular position of said box beam about said third axis;

wherein said third means comprise a cross piece mounted parallel to said third axis on an end of said box beam opposite said cradle, two arms, one end of each said arm pivotally mounted on each end of said cross piece about parallel fourth axes, said arms extending in a common plane and said sprayers mounted on the other end of each said arm, and servomotor means for pivoting each said arm about a respective fourth axis, and

wherein said cross piece is rotatable about a fifth axis parallel to the length of said cross piece, said apparatus including an articulated link pivoted between said cradle and said cross piece, wherein said common plane is always parallel to said first axis.

3. An apparatus for painting the interiors of vehicle body enclosures, comprising:

first means for supporting a vehicle and moving said vehicle along a first axis;

an electrostatic paint sprayer;

second means for supporting said sprayer;

third means operable on said second means for moving said sprayer in a direction transverse to said first axis between a first position coincident with said first axis and a second position spaced from said first axis and lateral to the sides of said vehicle; and

fourth means operable on said second means for moving said sprayer in a direction parallel to said first axis.

4,455,966

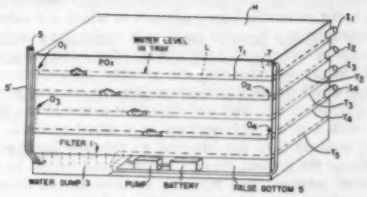
METHOD OF AND APPARATUS FOR HOLDING LIVE FISH AND THE LIKE

Albert H. Knowles, Moniack Bridge by Kirkhill, Scotland, assignor to K.R. Associates, Inc., Concord, N.H.

Continuation-in-part of Ser. No. 149,253, May 12, 1980, abandoned. This application Apr. 29, 1982, Ser. No. 373,151

Int. Cl.³ A01K *63/02*

U.S. Cl. 119—3 **8 Claims**



1. A method of holding a multiplicity of live fish, that comprises, resting the fish on a substantially flat tray surface in substantially side-by-side relationship, enveloping the surface with a dry oxygen-saturated atmosphere, and introducing a single shallow water layer upon the tray surface and of depth sufficient only to maintain the fish gills continuously damp, a multiplicity of the fish being positioned in said single shallow water layer retained by sidewalls of the tray so that movement of the multiplicity of live fish provides sufficient agitation of the water layer continually to mix oxygen into the shallow layer and thereby provide life-supporting utilization of the oxygen.

4,455,967

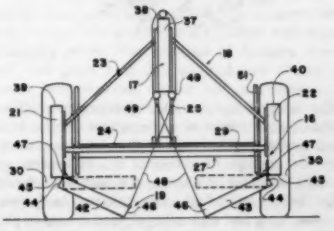
ANIMAL FEEDING APPARATUS

Lee H. Gibbs, Box 21, Fallon, Mont. 59326

Filed Oct. 26, 1982, Ser. No. 437,031

Int. Cl.³ A01K *5/00*

U.S. Cl. 119—58 **11 Claims**



1. Animal feeding apparatus including a base portion, a support portion, a divider portion and a trough portion; said base portion including a pair of spaced substantially horizontal

longitudinal sections, said longitudinal sections being disposed substantially parallel to each other, each of said longitudinal sections having a height significantly greater than the thickness thereof; said support portion including a plurality of spaced transverse members, each of said transverse members attached to and extending between said longitudinal sections along the length thereof, said transverse members being frame members including a horizontal section extending between said longitudinal sections with an upstanding section extending upwardly from said horizontal section, undercarriage means disposed adjacent to one of said transverse members and affixed thereto said undercarriage means including a tranasverse axle and wheels disposed adjacent the ends of said axle, hitch means disposed adjacent the end of said base portion remote from said undercarriage means; said divider portion including an elevated longitudinal center section, said center section being supported on and affixed to said upstanding sections of said transverse members, said center section being disposed in a generally horizontal orientation intermediate said longitudinal sections, said center section having a height significantly greater than the thickness thereof; an upper edge of said center section being located significantly above upper edges of said longitudinal sections; said trough portion including a pair of longitudinal movable sections, each of said movable sections having one longitudinal edge pivotally connected to the lower edge of one of said longitudinal sections, each of said movable sections being pivotable from a position in which it is substantially horizontal to a lowered position in which the free longitudinal edge of said movable sections are adapted to engage the g round, means for changing the position of said movable sections to said horizontal position and to said lowered ground engaging position; whereby said apparatus is towed to a feeding site with said movable sections in a raised position, said movable sections then are lowered so the free longitudinal edges engage the ground, thereby forming said trough by said longitudinal sections, said movable sections in the lowered position, and the ground between said movable sections so that when feed is placed between said longitudinal sections and after the feed has been consumed, said movable sections are raised again, said apparatus is towed to a new feeding site and said movable sections are lowered again to a feeding position.

4,455,968

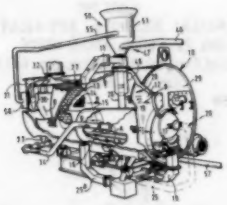
BOILERS

Reginald D. Northcote, Lower Penn, England, assignor to Thorn Emi Energy Developments, Limited, West Midlands, England

Filed Aug. 20, 1982, Ser. No. 409,897

Int. Cl.³ F22B 7/12; F23H 11/10

U.S. Cl. 122—4 D **9 Claims**



1. A boiler comprising an outer continuous shell within which is contained a steam or water space of the boiler; a furnace tube, containing a furnace grate, and a plurality of smoke tubes for passage of products of combustion of the furnace through the steam or water space, said boiler having an apparatus for feeding solid fuel to the furnace, said apparatus including a classifying and separating device; means to provide a flow of transport air to feed fuel along a feed conduit to the fuel classifying and separating device, said fuel classifying and separating device including a chamber being of a predetermined internal configuration to provide a low pressure area in which velocity of transport air carrying fuel through the feed conduit is reduced in the chamber so that coal dust and larger fine particles of predetermined size are carried upwardly through the chamber and separated from the remainder of the fuel; a further conduit extending downwardly from said chamber to the furnace to allow said remainder of the fuel to enter the furnace; and means for drawing off fine particles, when separated, and introducing them into the furnace tube in a direction at an angle from approximately 90° to 180° to the horizontal vector of the direction of flow of the products of combustion from the furnace tube.

4,455,969

FLUIDIZED BED COMBUSTOR

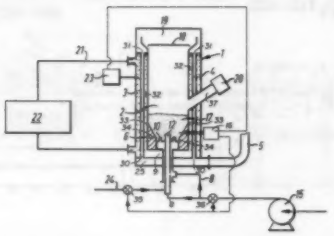
Derek Barker, Fleet, England, assignor to The British Petroleum Company Limited, London, England

Continuation of Ser. No. 337,440, Jan. 6, 1982, abandoned, which is a continuation of Ser. No. 127,875, Mar. 6, 1980, abandoned. This application Jun. 27, 1983, Ser. No. 508,329

Claims priority, application United Kingdom, Mar. 14, 1979, 7908943

Int. Cl.³ F22B 1/02

U.S. Cl. 122—4 D **10 Claims**



1. A fluidised bed combustor comprising:

a chamber containing a bed of fluidisible material, the chamber comprising

an upper portion in thermal contact with a heat exchanger connected to an external load, and

a lower portion having a lining for retarding heat transfer fron the bed to the heat exchanger, the lined lower portion having a volume capable of containing the greater part of the fluidisible bed material when the bed is slumped; and

means for terminating and resuming fuel flow and fluidising gas flow to the bed, the terminating and resuming means terminating fuel flow and fluidising gas flow to the bed when a pre-determined bed temperature or a pre-determined load temperature is attained, and resuming fuel flow and fluidising gas flow to the bed when one or both of the temperatures falls below its said predetermined temperature;

said means for terminating and resuming fuel flow and fluidising gas flow being at least one thermostat with ancillary control circuitry for opening and closing the fuel and fluidising gas flows;

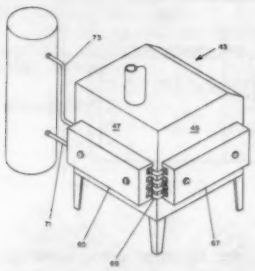
said at least one thermostat further including a load thermostat which is connected to the heat exchanger, and which terminates fuel flow and fluidising gas flow when the pre-determined load temperature is attained and which resumes fuel flow and fluidising gas flow when the load temperature falls below said pre-determined temperature, and where the bed thermostat in the lower portion of the chamber overrides the load thermostat if at the time the fuel and fluidising gas flows are due to be switching on by the load thermostat, the temperature of the bed material is below a desired pre-determined start-up bed temperature.

4,455,970

ADD-ON BOILER

Joseph A. Lyman, 21 Park St., Rutland, Vt. 05701, assignor to Francis J. Lyman, Pittsford, Vt.; Theresa M. Jacobs, Ontario, Calif.; Lauralee A. Socia, Rutland, Vt.; Lawrence A. Lyman, Rutland, Vt.; Mary F. Lyman, Rutland, Vt.; Richard F. Sullivan, Rutland, Vt. and Joseph A. Lyman, Rutland, Vt., a part interest

Filed May 19, 1983, Ser. No. 495,951
Int. Cl.³ F22B *33/00*; F28F *7/00*
U.S. Cl. 122—20 B 2 Claims



1. An add-on boiler in combination with a wood-burning, radiant-heating device to heat water for domestic hot water and/or hot water heating, said radiant heating device having a casing, said add-on boiler having a housing, finned heat-recovery coil and an insulated cover, said housing mounting therein said finned heat-recovery coil, said housing having a top, end walls and side walls, said insulated cover having a top, end walls and side walls corresponding to said respective top, end walls and side walls of said housing, said insulated cover being in spaced relationship from said housing and maintaining air spaces between said corresponding tops, end walls and side walls of said insulated cover and housing, said finned heat-recovery coil having pipes interconnected serpentine-fashion and fixed radiating fins, said radiating fins being in contact with the external surface of said casing of said radiant-heating device to conduct heat from said external casing surface to heat water in said pipes of said heat-recovery coil and to heat the water in said pipes of said heat-recovery coil by radiation of heat from said external casing surface, said insulated cover covering said heat-recovery coil and maintaining the heated water in said pipes of said heat-recovery coil at a sufficiently high-enough temperature to prevent the internal operating temperature in said radiant heating device from dropping below the critical temperature at which creosote forms and is deposited from the flue gases.

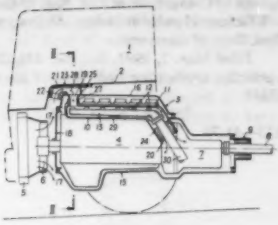
4,455,971

WATER-COOLED INTERNAL COMBUSTION ENGINE WITH A SOUND ABSORBING COVER

Karl Kirchweger, and Franz Knopf, both of Graz, Austria, assignors to Hans List, Graz, Austria

Filed Jul. 9, 1982, Ser. No. 396,701
Claims priority, application Austria, Jul. 14, 1981, 3108/81
Int. Cl.³ F01P *1/02*
U.S. Cl. 123—41.7 10 Claims

1. A water-cooled internal combustion engine with a sound-absorbing cover, the space enclosed by said cover being provided with air inlet and outlet openings sealed against the penetration of sound and being ventilated by cooling air during operation of the internal combustion engine, said air inlet opening being located at the top of said cover and being provided with a corresponding air collector mounted on the outside of the surrounding cover wall, said engine including an exhaust jacket which is separated from the remaining space of said cover and has a separate cooling air duct, a radiator cooling fan being placed outside of said cover in the vicinity of a cover wall serving as a radial deflector for the outgoing air from said fan, and with said exhaust jacket substantially leading



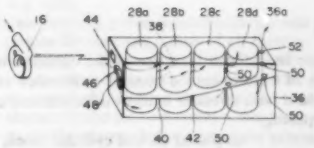
upwards from its outlet to its inlet opening, wherein said air inlet opening into said exhaust jacket is connected with the topmost jacket area and is placed such that it is exposed to the flow of cooling air going out from said fan.

4,455,972

CYLINDER BLOCK OF AN INTERNAL COMBUSTION ENGINE

Yasushi Kawakami, Yokohama, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Mar. 25, 1983, Ser. No. 478,859
Claims priority, application Japan, Apr. 15, 1982, 57-53666[U]
Int. Cl.³ F01P *3/02*
U.S. Cl. 123—41.74 5 Claims



1. A cylinder block of an internal combustion engine, having axially opposed first and second end wall portions, said cylinder block comprising:

first means defining in said cylinder block at least two cylinder bores which are aligned;

second means defining in said cylinder block a water jacket which extends axially in the direction from said first end wall portion to said second end wall portion while surrounding said cylinder bores, the volume of said water jacket being substantially unchanged throughout the axial length of said water jacket;

a partition wall member lying in said water jacket in a manner to divide said water jacket into an upper bore section and a lower bore section, said partition wall member being gradually raised with increase of distance from said first end wall portion so that the volumes of said upper and lower bore sections reduce and increases, respectively, with increase of distance from said first end wall portion, said partition wall member being formed, in the vicinity of said second end wall portion, with openings for connecting said upper and lower bore sections;

third means defining in said first end wall portion a water inlet opening which connects to said upper bore section;

fourth means defining in said first end wall portion another water inlet opening which connects to said lower bore section; and

fifth means defining in said second end wall portion an outlet opening which connects to said upper bore section.

4,455,973

CYLINDER HEAD FOR A WATER-COOLED INTERNAL COMBUSTION ENGINE

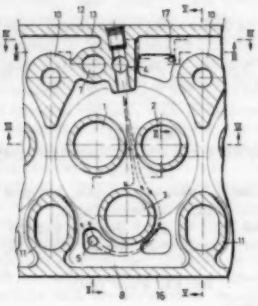
Hans Stadler, Berg-Gladbach; Lothar Bauer, and Wolfgang Strusch, both of Cologne, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,739

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1982, 3208341

Int. Cl.³ F01P 3/02

U.S. Cl. 123—41.76 12 Claims



1. A cylinder head for at least one of the cylinders in the cylinder block of a water-cooled internal combustion engine which is provided with direct or indirect injection, said cylinder head comprising:

a bottom adapted to be placed on said cylinder block;

first and second oppositely located delimiting walls which are respectively connected to said bottom of said cylinder head;

a turbulence chamber associated with said injection and communicating through said cylinder head bottom with a given cylinder;

at least two gas-changing channels for each cylinder for communicating through said cylinder head bottom with a given cylinder, said gas-changing channels being located between said turbulence chamber and said second delimiting wall, with a water chamber being provided around said gas-changing channels and said turbulence chamber;

a valve land located between each two gas-changing channels as part of said bottom of said cylinder head;

one nozzle-like main water overflow for each cylinder, said main water overflow being located between said gas-changing channels and said second delimiting wall, and communicating with said water chamber;

an auxiliary water overflow located on that side of said gas-changing channels remote from said main water overflow; and

an opening located between said first delimiting wall and said turbulence chamber for providing communication between said water chamber and said auxiliary water overflow; said main water overflow being adapted to provide in conjunction with said opening and said auxiliary water overflow a water flow which is directed toward said valve land and is at least substantially parallel to said bottom of said cylinder head.

4,455,974

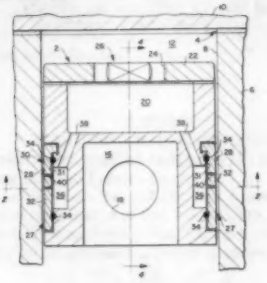
GAS BEARING PISTON ASSEMBLY

Wilbur Shapiro, Schenectady, N.Y., and Sargit S. Bupara, New Milford, Conn., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Jan. 8, 1981, Ser. No. 223,314

Int. Cl.³ F01L 11/00

U.S. Cl. 123—47 R 25 Claims



1. A piston assembly for reciprocating movement within a cylinder to form a variable volume chamber containing fluid gas under varying pressure conditions comprising:

(A) a piston body having a peripheral wall shaped to form a slight clearance space with an interior wall of the cylinder when said piston body is co-axially positioned for reciprocating movement within the cylinder, said piston body containing an annular recess formed in said peripheral wall and opening toward the interior wall of the cylinder;

(B) a source of gas under pressure including a gas reservoir chamber contained in said piston body and gas trapping means for allowing gas to flow from the variable volume chamber into said gas reservoir chamber when the gas pressure in the variable volume chamber is above the gas pressure within said gas reservoir chamber and for impeding reverse flow when the gas pressure in the variable volume chamber is below the gas pressure within said gas reservoir chamber; and

(C) bearing means for generating a gas layer within the clearance space between said piston body and the interior wall of the cylinder to hold said peripheral wall out of contact with the interior wall of the cylinder during reciprocating movement of said piston assembly, said bearing means including a radially expandable and compressible ring formed in equal arcuate segments extending end-to-end around said piston body positioned within said annular recess in contact with the gas layer, said bearing means further including gas flow restriction means in communication with said source of gas for establishing a controlled flow of gas into the gas layer to cause the gas layer to impart a radially inwardly directed force on said ring which varies circumferentially between limits in inverse proportion to the radial thickness of the corresponding circumferential portion of the gas layer, biasing means for imparting to said ring an outwardly directed radial force having a magnitude intermediate the magnitude limits of said radially inwardly directed force imparted to said ring by the gas layer to cause each circumferential portion of said ring to seek such a force balanced radial position, wherein said biasing means includes gas pressure means for subjecting a predetermined area of an interior surface of each said ring segment defined by a pair of annular resilient seals positioned between said piston body and each said ring segment to provide a predetermined radially outward bias to each said ring segment to gas pressure from said reserovir chamber, and joint sealing means for rendering the end-to-end joints between adjacent ring segments substantially impervious to radial gas flow,

wherein each said joint sealing means includes an interior insert spanning circumferentially between said segments and extending axially between said resilient seals and further includes an exterior insert assembly spanning circumferentially between said segments and extending axially along the entire axial extent of said piston segments.

4,455,975

V-TYPE MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

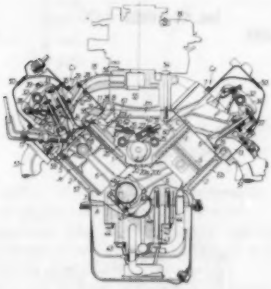
Tadashi Kume, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1982, Ser. No. 339,136

Claims priority, application Japan, Jan. 16, 1981, 56-3903; May 13, 1981, 56-72026

Int. Cl.³ F02B *19/00*

U.S. Cl. 123—52 MV **3 Claims**



1. A V-type multi-cylinder internal combustion engine comprising, in combination: a cylinder block having two banks of cylinders arranged in a shape of a letter "V" and having a horizontal joint plane at its upper surface, a pair of cylinder heads with each mounted on one bank of cylinders, respectively, an intake manifold positioned between said cylinder heads and secured to the cylinder block only on said horizontal joint plane by means of vertically extending bolts, said cylinder heads each having an inclined surface receiving and facing a similarly inclined surface on said intake manifold, each cylinder and its cylinder head defining at least one combustion chamber, each of the cylinder heads including intake port means leading to each combustion chamber, said intake manifold having distribution passages aligned with said intake port means, a groove in at least one of the two facing surfaces of said intake manifold and each cylinder head surrounding each said aligned intake port means and distribution passage, and an O-ring seal means positioned in each said groove for resiliently connecting each said aligned said intake port means and said distribution passage means.

4,455,976

INTERNAL COMBUSTION ENGINES

John H. McCandless, 2724 San Rae Dr., Kettering, Ohio 45419

Filed Apr. 6, 1982, Ser. No. 366,045

Int. Cl.³ F02B *1/00*; F01L *7/00*

U.S. Cl. 123—197 A **1 Claim**

1. An apparatus for adjusting a piston stroke while maintaining constant compression ratio comprising:

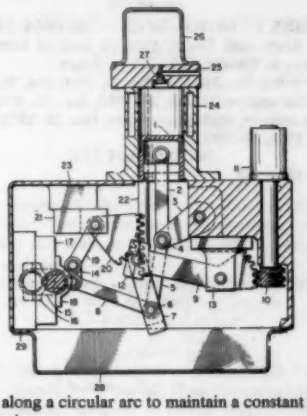
A pair of tandem pistons;

A pair of first connecting rods, each having opposite ends, one end being connected to a respective one of said pistons;

A second connecting rod having an inverted U shape with a base and free parallel ends, with the base of said second connecting rod being connected to an end opposite said one end of each of said first connecting rods via a first shaft;

A U shaped arm comprising a base and parallel legs extending from said base with a portion of the legs adjacent the base of the U shaped arm being connected to the ends opposite said base of said second connecting rod via a second shaft;

A control arm being connected at one end thereof to a top portion of the legs of said U shaped arm along a pivot point, said control arm having means to vary said pivot



point along a circular arc to maintain a constant compression ratio;

An air pumping piston located adjacent said pair of tandem pistons for injecting a flow of air thereto, and being connected via linkage means to said second shaft;

A rotary valve means located above said air pumping piston to control the air flow such that said tandem pistons are alternately fed air, said rotary valve being operated off of an overhead cam shaft via a reciprocating rack and pinion gearing.

4,455,977

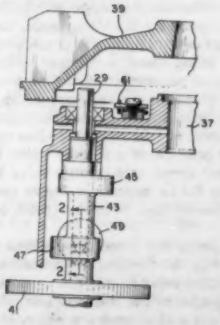
COMPRESSION BRAKE SYSTEM

Steven R. Kuczenski, New Holstein, Wis., assignor to Tecumseh Products Company, Tecumseh, Mich.

Filed Aug. 31, 1981, Ser. No. 297,876

Int. Cl.³ F02B *77/08*

U.S. Cl. 123—198 DC **16 Claims**



1. A safety device for an implement powered by an internal combustion engine and having a deadman control normally biased toward a first position and actuable by a person operat-

ing the implement to a second position for reducing the time for the engine to come to a stop when the deadman control is released, the engine including inlet and exhaust valves and means for opening said valves at predetermined times in each normal operating cycle of the engine, the safety device comprising: an engine ignition impeding switch operable upon release of the deadman control to disable the engine ignition system, and means operable upon release of the deadman control during continued rotation of the engine for opening one of said engine valves at a time other than its normal opening time in the normal engine cycle.

4,455,978

ENGINE ROTATION SPEED CONTROL SYSTEM

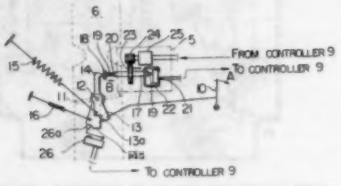
Takeshi Atago, and Toshio Manaka, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Division of Ser. No. 218,672, Dec. 22, 1980, Pat. No. 4,303,506. This application Jan. 20, 1983, Ser. No. 459,665

Claims priority, application Japan, Dec. 28, 1979, 54-170527; Dec. 28, 1979, 54-170528

Int. Cl.³ F02M 3/00

U.S. Cl. 123—339 **27 Claims**



1. An engine rotation speed control system comprising:

an actuator for prescribing the recovery position of a throttle valve;

recovery position sensor means for detecting that the throttle valve is brought into the recovery position;

means for setting said actuator such that said recovery position of said throttle valve shifts to a predetermined position at which the opening degree of the throttle valve is larger than that for the idling position, when said recovery position sensor means detects that said throttle valve deviates from said recovery position;

means for detecting rotation speed of the engine;

a negative pressure restricting unit for controlling said actuator such that a reduction in intake negative pressure for said engine to below a preset negative pressure is prevented, when said throttle valve is placed in said recovery position during the engine rotation being at a rate in excess of a predetermined rotation speed which is larger than a rotation speed for the idling mode; and

idling speed control means for controlling said actuator such that an idling speed is obtained which is determined by operational parameters of said engine, when said throttle valve is placed in said recovery position during the engine rotation being below the predetermined rotation speed.

15. A method of operating an engine speed control system wherein the position of a throttle valve is adjusted so as to control engine speed, said throttle valve being displaced in a first direction for an increase in engine speed and in a second direction for a decrease in engine speed, comprising the steps of:

(a) establishing the position to which said throttle valve recovers in the event of the release of a displacement of said throttle valve in said first direction;

(b) in response to the displacement of said throttle valve away from said recovery position in said first direction thereby increasing the speed of operation of said engine, causing the position to which said throttle valve is to recover to be established at a prescribed position which will result in an engine operation speed larger than the operation speed of said engine for the recovery position of the throttle valve during idling of the engine; and

(c) in response to the recovery of said throttle valve to the prescribed position established in step (b), adjusting the recovery position of said throttle valve in such a manner that the engine operation speed is gradually reduced from said larger engine operation speed to the idling engine operation speed.

4,455,979

CARBURETTORS FOR INTERNAL COMBUSTION ENGINES

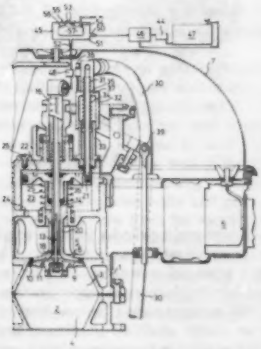
Maurice L. Brown, Rewa, Via Feilding, New Zealand, assignor to Maurice Lechmere Brown; Ian Howard Batchelar; Graham Arthur Ogilvey and John Gerrad Noonan, all of Rewa, Via Feilding, New Zealand

Filed Feb. 28, 1983, Ser. No. 470,041

Claims priority, application New Zealand, Mar. 1, 1982, 199858

Int. Cl.³ F02P 5/00

U.S. Cl. 123—407 **19 Claims**



1. A carburettor for an internal combustion engine comprising a body, an air passageway therethrough, leading in use from ambient air to the internal combustion engine and including a venturi tube therein, a movable air control valve member in or adjacent said venturi tube and forming part of a movable assembly, a fuel control valve member associated with said air control valve member, a movable wall connected to but spaced away from said air control valve member so as to be movable therewith and so as to form part of said movable assembly, said movable wall separating a first and second pressure chamber in said body, biasing means to bias said movable assembly to a biased position, a low pressure conduit between a part of said first pressure chamber, a pressure control entry to said firs' pressure chamber, a balancing pressure entry to said secon pressure chamber, a low pressure control valve member controlling pressure from said low pressure conduit to said first pressure chamber and positionable relative to a part movable with said movable assembly and manually operable actuating means to programme positioning of said low pressure control valve member so that movement of said movable assembly relative to said low pressure control valve member due to relative forces acting on said movable assembly causes variation of pressures in said first pressure chamber and hence variation of position of said movable assembly including said air control valve member and said fuel control valve member to control power from an internal combustion engine to which the carburettor is fixed in accordance with selected positions of said manually operable actuating means.

18. A carburettor as claimed in claim 1 wherein an ignition

advance and retard control valve is provided having a valve actuating member actuated by said movable assembly to restrict vacuum applied to a distributor moving means when said movable assembly is at or near said biased position.

4,455,980

ENGINE COMBUSTION CONTROL METHOD

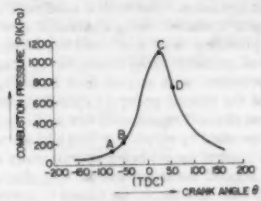
Takao Sasayama; Matsuo Amano, both of Hitachi; Takeshi Hirayama, Mito; Shinichi Sakamoto, Hitachi, and Masayuki Miki, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,585

Claims priority, application Japan, Sep. 12, 1980, 55-125947

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—425 **14 Claims**



1. A method of controlling the operation of an internal combustion engine comprising the steps of:

(a) in response to prescribed engine operation conditions, establishing a base ignition timing as a function of said prescribed conditions;

(b) generating respective first signals representative of the combustion pressure within a combustion chamber of a cylinder of said engine for respective changes of the volume of said combustion chamber;

(c) generating a second signal representative of engine output torque on the basis of the integration of said first signals generated in step (a);

(d) generating a third signal representative of an ignition timing correction value on the basis of the torque represented by said second signal; and

(e) generating an ignition timing signal for controlling the combustion operation of said engine in accordance with the base ignition timing established in step (a) and said third signal generated in step (d), so as to effectively maximize said engine output torque.

4,455,981

METHOD AND SYSTEM FOR CONTROL OF AIR-FUEL RATIO

Atsushi Suzuki, Kariya; Yutaka Kawashima, Okazaki, and Masakazu Ninomiya, Kariya, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 25, 1982, Ser. No. 342,427

Claims priority, application Japan, Jan. 26, 1981, 56-9836

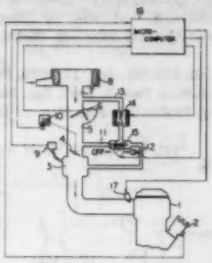
Int. Cl.³ F02B *3/08, 32/00*

U.S. Cl. 123—438 **11 Claims**

1. In a method of controlling the air-fuel ratio comprising an air intake pipe for introducing air into an engine, a throttle valve provided in said air intake pipe, and fuel supply means for metering the intake air flow, detecting the operating conditions of the engine and supplying the fuel in accordance with the metered air flow and the engine operating conditions, said method including the steps of changing the air-fuel ratio alternately to slightly richer and leaner sides of a base air-fuel ratio, operating the engine with mixture of said changed air-fuel ratio, detecting the resulting change of the output condition of said engine, determining the direction of change of the optimum air-fuel ratio from the result of said detection, and correcting said base air-fuel ratio in said direction thus determined; the improvement of said method comprising steps of

introducing auxiliary air not metered by said fuel supply means into said air intake pipe,

determining whether to introduce said auxiliary air to the upstream portion of said throttle valve or to the downstream portion of said throttle valve on the basis of the result of detection of the engine operating conditions,



introducing said auxiliary air to the position based on said result of decision, and

changing the base air-fuel ratio alternately to the slightly richer and leaner sides with said auxiliary air.

4,455,982

ELECTROMAGNETICALLY ACTUATABLE VALVE

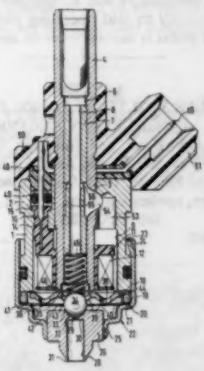
Udo Hafner, Lorch, and Waldemar Hans, Bamberg, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 8, 1982, Ser. No. 415,949

Claims priority, application Fed. Rep. of Germany, Mar. 5, 1982, 3207919

Int. Cl.³ F02M *51/08*

U.S. Cl. 123—472 **4 Claims**



1. An electromagnetically actuatable valve, particularly a fuel injection valve for a fuel injection system in an internal combustion engine, comprising a valve casing, a fuel pipe comprised of an electromagnet core of ferromagnetic material extending into the interior cavity of the valve casing, a solenoid winding disposed on said core, said winding mounted in said casing so that fluid can circulate thereabout, an armature and guide means arranged to actuate a valve element positioned in a valve seat in said valve casing, characterized in that said interior cavity of said valve casing further includes at least one means providing an exhaust line which faces in the oppo-

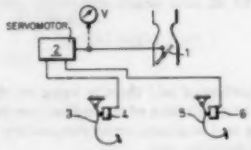
site direction from said valve seat and said exhaust line is in communication with means defining an opening in said fuel pipe.

4,455,983

METHOD AND ARRANGEMENT FOR OPERATION OF AN INTERNAL COMBUSTION ENGINE OF A VEHICLE

Ernst Fiala, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Division of Ser. No. 163,491, Jun. 27, 1980, Pat. No. 4,377,995.
This application Nov. 8, 1982, Ser. No. 439,727
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1979, 2926106
Int. Cl.³ F02M 51/00
U.S. Cl. 123—478 22 Claims



1. Apparatus for controlling the setting of a fuel metering device for an internal combustion engine for a motor vehicle having an accelerator pedal, to provide the setting which yields the highest ratio of output power to fuel consumption for each operating speed of said engine, comprising:

an engine speed sensor;

a memory for storing the fuel metering device settings to be used at each engine speed said memory including means responsive to said speed sensor for providing an output setting;

operating means responsive to said memory output for setting said fuel metering device; and

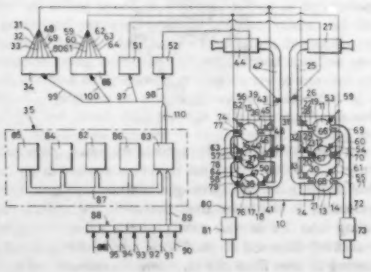
a first switch operated by said accelerator pedal for connecting said memory to said operating means as long as the accelerator pedal is moved from its at-rest position.

4,455,984

MODULAR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Luigi Merlini; Aldo Bassi, and Giuseppe Satta, all of Milan, Italy, assignors to Alfa Romeo Auto S.p.A., Naples, Italy

Filed Feb. 25, 1983, Ser. No. 469,685
Claims priority, application Italy, Feb. 26, 1982, 19881 A/82
Int. Cl.³ F02B 3/00
U.S. Cl. 123—481 4 Claims



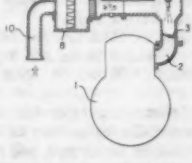
1. A multi-cylinder Otto cycle internal combustion engine for motor vehicles, provided with manual adjustment means for controlling the power required of the engine, said engine being provided with a feed arrangement for the air and petrol mixture which comprises feed throttling means and feed shut-off means operationally connected to actuator means and to means for controlling actuation as a function of prechosen engine parameters and of the power required of the engine, the engine being also provided with an ignition system comprising spark plugs operationally connected to actuator means and to means fo controlling the actuation of said spark plugs as a function of prechosen engine parameters, the engine being also provided with sensors for said engine parameters and with measuring devices for measuring the operating conditions of said manual adjustment means and operationally connected to said means for controlling the actuation of the throttling means, of the shut-off means and of the spark plugs, said engine being characterised by comprising a first group of cylinders having a high geometrical compression ratio with a value exceeding 12.5:1, and a second group of cylinders having a geometrical compression ratio with a maximum value of 11:1, the first group of cylinders being connected to a first mixture feed system provided with first feed throttling means, the second group of cylinders being connected to a second mixture feed system provided with second feed throttling means, the feed system of the second group of cylinders being also provided with feed shut-off means, said first and second throttling means being operated by respective first and second actuators, said actuation control means being operationally connected to said first and second actuators and to said shut-off means in order to cause said first throttling means to meter the feed to said first group of cylinders and to cause said shut-off means to interrupt feed to the second group of cylinders for predetermined values of prechosen engine parameters and for required engine powers less than the values pertaining to a prechosen limiting curve, and in order to cause said shut-off means to restore feed to the second group of cylinders and to cause said first and second throttling means to meter the feed to the respective groups of cylinders for further predetermined values of said prechosen engine parameters and for power requirements greater than those of said limiting curve, up to the values pertaining to the engine maximum power curve.

4,455,985

ELECTRONIC CONTROL TYPE FUEL INJECTION APPARATUS

Yoshiaki Asayama, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 244,094, Mar. 16, 1981, abandoned.
This application Sep. 15, 1983, Ser. No. 532,300
Claims priority, application Japan, Mar. 14, 1980, 55-32895
Int. Cl.³ F02B 51/04
U.S. Cl. 123—494 3 Claims



1. An electronic control type fuel injection apparatus which comprises:

a vortex air-flow meter for sensing a suction air-flow rate of air fed into an internal combustion engine and for generating a frequency output indicative of a vortex air-flow rate depending upon a suction air-flow rate sensed by the vortex air-flow meter;

a control device for controlling injecting of fuel, including

an electromagnetic valve, and means for actuating said valve for a specific period substantially in synchronization with the frequency output of said vortex air-flow meter;

an air-cleaner placed upstream of said vortex air-flow meter; and

a pressure sensor for sensing variation of pressure of the section air fed into said vortex air-flow meter, which is caused by said air-cleaner;

wherein said actuating means controls commencement of actuation of said valve based on the frequency output of said vortex air-flow meter independent of engine speed and controls and duration of actuation of said valve based on the output of said pressure sensor.

4,455,986

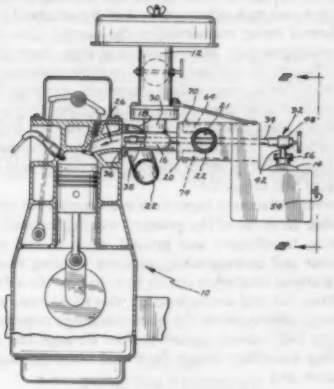
ENGINE FUEL SUPPLY SYSTEM

Elmer G. Finken, 601 5th St., NE., Montgomery, Minn. 56069

Filed Jan. 6, 1983, Ser. No. 455,965

Int. Cl.³ F02M *31/00*

U.S. Cl. 123—557 **12 Claims**



1. In an engine fuel supply system having a fuel/air intake manifold, at least one engine intake port open to the intake manifold, an exhaust manifold, and at least one exhaust port open to the exhaust manifold, the improvement including:

A. a fuel tank;

B. a supply of volatile liquid fuel in fuel tank;

C. a fuel vapor generator for each engine intake port and open from below the surface of the liquid fuel in the tank through an outer wall of said intake manifold to position adjacent to each intake port, said generator including:

(1) a heat conductive fuel vaporizing conduit having a first gaseous fuel discharge end portion adjacent the engine intake port and a second liquid fuel entry end portion,

(2) a gaseous fuel delivery plug in the first end portion of the vaporizing conduit, said plug having a restricted gaseous fuel discharge orifice therethrough, and

(3) a liquid fuel delivery conduit open from below the liquid fuel in the tank to the second end of the vaporizing conduit;

D. an enclosed heat exchange chamber encompassing each of said fuel vaporizing conduits and having an inlet opening and an outlet opening spaced from the inlet opening;

E. an exhaust pipe open from the exhaust manifold to the heat exchange chamber inlet opening; and

F. the heat exchange chamber outlet opening communicating with a predetermined area for discharge of exhausted products of combustion from the chamber.

4,455,987

METHOD OF AND AN ARRANGEMENT FOR CONTROLLING RETURN QUANTITIES OF EXHAUST

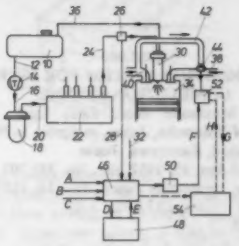
Rainer Südbeck, Duisburg; Hans Baumgartner, Viersen, and Eckehard Schmitz, Monchen-Gladbach, all of Fed. Rep. of Germany, assignors to Pierburg GmbH & Co. KG, Neuss, Fed. Rep. of Germany

Filed Jul. 12, 1982, Ser. No. 397,455

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1981, 3128239

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **21 Claims**



12. An arrangement for controlling return quantities of exhaust for an automatic-ignition internal combustion engine which is supplied by a camshaft-driven piston injection pump and which comprises an element for controlling quantities of exhaust associated with an exhaust return pipe, characterised by a sensor for connection to an injection system following its injection pump for generating first signals corresponding directly or indirectly to output fuel pressure pulses of the injection pump; by means for generating two signals which correspond to the variables injection duration T_E and injection period T_P per work cycle or to a combination thereof from the first signals, and by a control unit for processing the second signals, influencing the element which controls the quantities of exhaust and comprising an identification—field memory in which the control quantities—to be retrieved—for the return quantities of exhaust are stored at least in dependence upon the second signals.

4,455,988

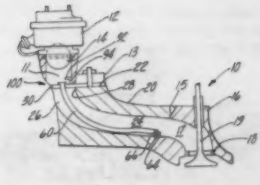
FUEL ECONOMIZER

Victor F. Zwierzelewski, 3870 Kiefer, Warden, Mich. 48091

Filed Dec. 30, 1981, Ser. No. 336,104

Int. Cl.³ F02M *29/00*

U.S. Cl. 123—590 **19 Claims**



1. A fuel economizer device for use with an internal combustion engine, wherein said internal combustion engine has an inlet port, an intake manifold mounted adjacent said inlet port and a carburetor mounted on said intake manifold, said intake manifold having an intake portion, an exit portion opposite said intake portion and interconnected with said inlet port for fluid flow therebetween, and at least one passage in said intake manifold extending from said intake portion to said exit portion, said carburetor further being mounted adjacent to said

intake portion, said carburetor further providing a mixture of fuel and air for flow into said internal combustion engine, said fuel economizer device comprising:

a stationary plate member interposed said carburetor and said intake portion of said intake manifold, said plate member having at least one aperture therethrough; and

one tube disposed through said at least one aperture in said plate member and extending longitudinally in said passage of said intake manifold from said intake portion toward said exit portion, said tube further concentrating the mixture of fuel and air from said carburetor and conveying the mixture of fuel and air to a point adjacent but spaced away from said inlet port of said internal combustion engine.

4,455,989

PLASMA IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

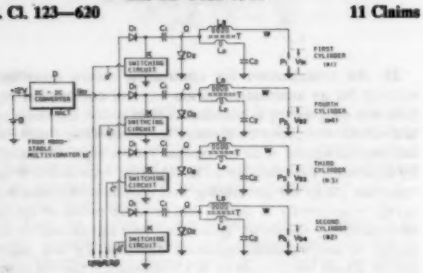
Hiroshi Endo; Masazumi Sone; Iwao Imai, and Yasuki Ishikawa, all of Yokosuka, Japan, assignors to Nissan Motor Company, Limited, Kanagawa, Japan

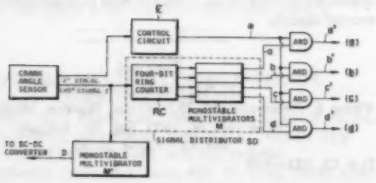
Filed Jun. 15, 1982, Ser. No. 388,703

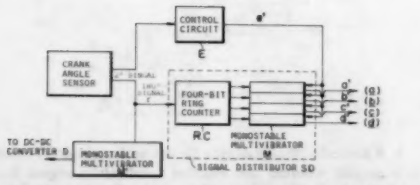
Claims priority, application Japan, Jun. 16, 1981, 56-92478

Int. Cl.³ F02P *3/08*

U.S. Cl. 123—620 **11 Claims**







1. A plasma ignition system for an internal combustion engine having a plurality of engine cylinders, comprising:

(a) a plurality of plasma ignition plugs each provided within the corresponding cylinder for igniting fuel supplied into the corresponding cylinder, said each plasma ignition plug having a grounded side electrode and central electrode, an electrical insulating member located between the two electrodes, and a discharge gap with a hole provided between the two electrodes so as to carry out plasma discharge;

(b) a DC-DC converter which generates and outputs a high DC voltage;

(c) a plurality of first capacitors connected to said DC-DC converter, each for charging and discharging the high DC voltage outputted from said DC-DC converter;

(d) a plurality of switching circuits, each connected to one terminal of said corresponding first capacitor and which grounds the one terminal of said corresponding first capacitor in which the high DC voltage from said DC-DC converter is fully charged with the other terminal of said corresponding first capacitor in a floating state, in response to a trigger pulse signal received at a drive terminal thereof, said trigger pulse signal controlling the time interval within which said corresponding first capacitor is grounded so as to feed the plasma ignition energy charged therewithin into said corresponding plasma ignition plug according to the pulsewidth thereof;

(e) a plurality of transformers, each common terminal of both primary and secondary windings thereof being connected to the other terminal of said corresponding first capacitor and each other terminal of the secondary winding thereof being connected to the central electrode of said corresponding plasma ignition plug and each of which boosts the voltage applied to the primary winding thereof at the corresponding secondary winding thereof to a voltage level enough for the corresponding plug to generate a spark discharge according to the winding ratio therebetween immediately after said corresponding switching circuit grounds the one terminal of said corresponding first capacitor;

(f) a plurality of second capacitors each connected between the other terminal of the primary winding of said corresponding transformer and ground, each of said second capacitor and corresponding primary winding constituting a damped oscillation circuit so as to provide a damped oscillation for said corresponding plug to generate a glow discharge subsequent to the spark discharge responsive to the high DC voltage applied thereto through said corresponding switching circuit from said corresponsing first capacitor; and

(g) a trigger pulse signal generator which generates and outputs circularly said trigger pulse signal into each of drive terminals of said switching circuits according to the ignition order of the engine cylinders, the width of said trigger pulse signal becoming narrower when the engine rotates at a speed exceeding a first predetermined value than a first predetermined width of said trigger pulse signal having a time interval enough for said corresponding plasma ignition plug to generate an arc discharge subsequent to the glow discharge.

4,455,990

PULLEY FOR COMPOUND BOW

Alex J. Barna, 1216 Crawford St., Duquesne, Pa. 15110

Division of Ser. No. 163,152, Jun. 26, 1980, Pat. No. 4,337,749, which is a division of Ser. No. 927,547, Jul. 24, 1978, Pat. No. 4,261,320. This application May 24, 1982, Ser. No. 381,059

Int. Cl.³ F41B *5/00*

U.S. Cl. 124—86 **5 Claims**

1. Apparatus for rotatably supporting a cable of a compound bow comprising,

a pulley for receiving a cable,

said pulley having a ring-like configuraion with a reduced body portion so as to provide a substantialldy hollow pulley with a minimum mass,

a bore extending through said body portion,

a rim portion of said body portion, said rim portion having a periphery,

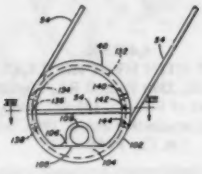
a first annular groove on said periphery of said rim portion

for receiving a first portion of a cable reeved about said pulley,

a second annular groove on said periphery of said rim portion for receiving a second portion of a cable reeved about said pulley,

said second annular groove being laterally spaced from said first annular groove,

a first set of a plurality of circumferentially spaced slots extending on said rim portion and into intersecting relation with said first annular groove,



cable passage means positioned on said rim portion diametrically across from said first set of circumferentially spaced slots for receiving a cable,

said cable passage means extending on said rim portion and into intersecting relation said second annular groove, and

said cable passage means arranged to receive a cable extending through a selected one of the slots of said first set of slots to thereby transfer a cable from said first annular groove to said second annular groove so that the amount of cable positioned on said rim portion is adjustable.

4,455,991

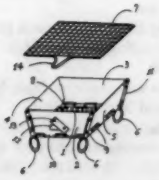
FOLDING BARBECUE

Wen-Kuang Su, P.O. Box 87-301, Taipei, Taiwan

Filed Jul. 14, 1982, Ser. No. 398,420

Int. Cl.³ F24C *1/16*

U.S. Cl. 126—9 R **6 Claims**



1. A folding barbecue comprising a bottom panel, and four wall panels, each pivotably connected with one side of said bottom panel, any two adjacent panels being provided with passage means which cooperate to form a passage at their adjacent edges, and a plurality of pins, passing upwardly through the passages to secure the barbecue in assembled state, the lower ends of said pins serving as leg supports of the barbecue and having support means provided thereon to support the assembled barbecue off the ground, two of said wall panels being foldable over said bottom panel and the other two of said wall panels being foldable beneath the bottom panel, whereby said barbecue can assume a substantially flat state as soon as said leg supports are withdrawn.

4,455,992

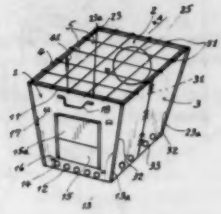
FOLDING ROASTER

Chin-Wen Hsiao, No. 16, Alley 2, Lane 384, She-Chung St., Shih-Lin, Taipei, Taiwan

Filed Feb. 15, 1983, Ser. No. 437,758

Int. Cl.³ F24C *1/16*

U.S. Cl. 126—9 R **1 Claim**



1. A folding roaster comprising:

a front trapezoid plate having a main air inlet hole, a rear trapezoid plate having an air draft hole, two folding side plates, an uppermost screen, a middle screen, a lower screen and a bottom ash pan, in that said front trapezoid plate, said rear trapezoid plate and two folding side plates being developed for putting the screens on the roaster, said uppermost screen being put on the top edges of roaster for roasting use, said middle screen being put on the middle portion of roaster for supporting burning charcoal, said lower screen being put on the lower portion of roaster for supporting burning wood, and said bottom ash pan being put on the lower portion of roaster or under the roaster for collecting ash;

the improvement which comprises:

a front trapezoid plate comprising a longer top edge, a shorter bottom edge and two side edges to form a trapezium which is pivotedly coupled with each said folding side plate by a hinge, said front trapezoid plate being formed with a plurality of bottom holes near the bottom edge thereof for leading combustion air into roaster;

a rear trapezoid plate comprising a longer top edge, a shorter bottom edge and two side edges to form a trapezium which is pivotedly coupled with each said folding side plate by a hinge, said rear plate being formed with a plurality of bottom holes near the bottom edge of the plate;

said front and rear trapezoid plate which are each formed with two lower brackets to support said lower screen or bottom ash pan, and each formed with two upper brackets to support said middle screen, and pivotedly formed with two handles for portable use; and

two folding side plates each comprising a central hinge which can be folded to collapse the roaster, two side edges each pivotedly coupled with said front trapezoid plate and said rear trapezoid plate respectively by two hinges, and a plurality of bottom holes formed near the bottom edge.

4,455,993

CERAMIC STOVE

Manfred Goetz, 7914 Turtle Valley Dr., Clifton, Va. 22024

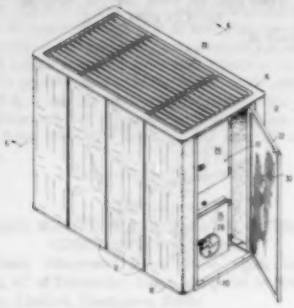
Filed Mar. 9, 1981, Ser. No. 242,151

Int. Cl.³ F24C *15/08*

U.S. Cl. 126—64 **22 Claims**

1. A stove for burning wood, coal or like fuel comprising, a firebox having a combustion chamber for receiving a burning fuel, a plurality of heat panels of non-metallic, heat-absorbing and radiating materials mounted relative to the firebox in side-by-side relationship spaced from the firebox to form air passages between the heat panels and the firebox, said heat panels extending in a single piece the full height of the firebox and having adjacent side edge portions in lapped relationship while being free of any positive fastening means interconnect-

ing said panels, and wherein said firebox includes a generally vertical back wall having an exhaust outlet located at an upper portion thereof, and wherein there is further included a flue mounted to said back wall in registry at one end with said



exhaust outlet and extending from said outlet downwardly in a plane generally parallel to said back wall and terminating in an outlet at an elevation substantially lower than that of said outlet in the back wall of the firebox.

4,455,994

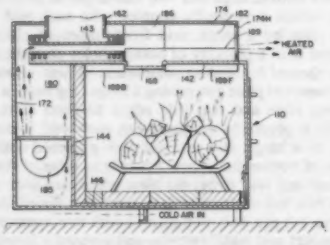
WOODBURNING HEATING STOVE AND HEAT EXTRACTOR

Matthew W. Homolik, 2390 Ransell Rd., Merrifield, Va. 22116

Continuation-in-part of Ser. No. 181,477, Aug. 26, 1980, Pat. No. 4,361,131. This application Jul. 9, 1982, Ser. No. 396,897

Int. Cl.³ F24B 7/00

U.S. Cl. 126—123 **8 Claims**



1. An apparatus comprising at least a heat extracting manifold for a wood burning stove adapted to extract heat from combustion gases flowing between a combustion chamber of the wood burning stove and a flue, said heat extracting manifold including:

(a) a body portion having an interior cavity,

(b) first and second inlet projecting portions disposed respectively adjacent opposite first and second ends of said body portions, said first and second projecting portions both projecting out forwardly from said body portion,

(c) first and second combustion gas inlet holes disposed at least partially in said respective first and second inlet projecting portions,

(d) an outlet conduit centrally disposed in said manifold, projecting up from said body portion, and adapted to feed combustion gases to the flue, and

(e) a plurality of spaced heat conductive fins for transmitting heat between combustion gases passing from said first and second inlet holes to said outlet conduit and air to be warmed up which is disposed in heat exchange relationship to said heat extractor, and

wherein at least some of said fins are mounted on a curved surface portion of said manifold and wherein said heat extracting manifold further comprises an air heating conduit extending into said interior cavity for passing air therethrough such that the air may be heated by combustion gases disposed in said interior cavity and wherein at least some of said fins are mounted on said air heating conduit.

4,455,995

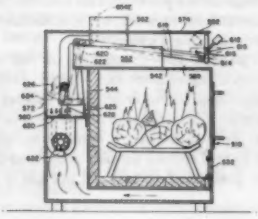
HEATING STOVE WITH HEAT REGULATING SYSTEM

Matthew W. Homolik, 2390 Ransell Rd., Merrifield, Va. 22116

Continuation-in-part of Ser. No. 181,477, Aug. 26, 1980, Pat. No. 4,361,131. This application Jul. 9, 1982, Ser. No. 396,898

Int. Cl.³ F24B 7/00

U.S. Cl. 126—123 **8 Claims**



1. A heating stove comprising:

a combustion chamber having front, back, top, bottom and side walls;

an outer shell at least partially enclosing said combustion chamber including an auxiliary back wall spaced from said back wall to provide a first rearward air space between said back wall and said auxiliary top wall spaced from said top wall to provide a second air space between said top wall and said auxiliary top wall for passage of heated air into a room to be heated;

a heat extracting manifold mounted to at least one wall of said combustion chamber for transferring heat from combustion gasses to air;

a blower for blowing air to flow in heat transfer relationship with said heat extracting manifold, said blower supported by said outer shell;

a hot air outlet from said outer shell allowing heated air to exit from said wood burning stove;

a flue outlet from said outer shell for allowing combustion gasses from said combustion chamber to pass to a flue;

control means supported by said outer shell and operable to cause a flue clearing portion of air blown by said blower to proceed out said flue outlet, the flue clearing portion of air proceeding out the flue to minimize any back flowing of combustion gases which might otherwise be caused by a column of cool air in the flue; and

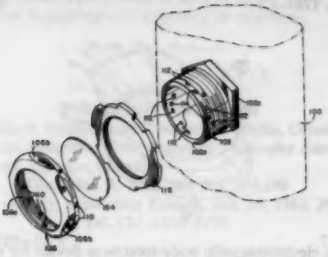
a valve controlled by said control means and wherein the opening of said valve by operation of said control means allows at least some air blown by said blower to proceed out said flue outlet; and wherein said valve includes a blocking member and a pipe having an entry hole for flue clearing air, said entry hole in a path of blown air from said blower, and said pipe leads air blown in said entry hole to proceed out said flue outlet and said blocking member is controlled by said control means to selectively block air from entering said entry hole.

4,455,996

CHIMNEY SENTINEL

Louis V. Achilles, Sr., Box 384, Sunapee, N.H. 03782

Filed Aug. 27, 1982, Ser. No. 412,182
Int. Cl.³ F23M 7/00; F24D 15/04
U.S. Cl. 126—200 11 Claims



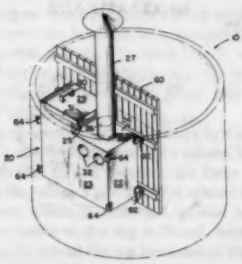
1. A flue pipe safety apparatus comprising:
(a) a hollow bushing sealingly engaging an aperture in said flue pipe and extending away from said pipe to define a remote bushing opening;
(b) sight glass means for covering said remote bushing opening and for permitting the viewing of the interior of said flue through said bushing;
(c) bushing cap means removably mounted on said bushing for retaining said sight glass means over said opening; and
(d) condensate prevention means for reducing the condensation of smoke on said sight glass means said condensate prevention means comprising a plurality of alignable apertures substantially adjacent to the interior surface of said sight glass means defined by said bushing cap means and said hollow bushing, said apertures being disposed when aligned to cause ambient air to be drawn across the interior surface of said sight glass means during flue operation.

4,455,997

HEATING UNIT FOR HOT TUBS AND/OR SPA UNITS

Hawley R. Evans, Fairbanks, Ak., and Charles B. Howe, King, Wash., assignors to Snorkel Stove Co., Seattle, Wash.

Filed Jul. 13, 1981, Ser. No. 283,027
Int. Cl.³ F24B 9/00
U.S. Cl. 126—367 15 Claims



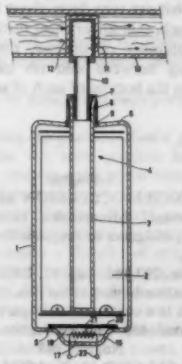
1. A wood- or coal-burning heating unit designed to be submerged into a tank of water, comprising:
an aluminum, submersible shell having a bottom, end walls, sidewalls, a top including (1) a top wall adjacent to one end wall having a stack opening connecting to a stack, (2) an open fuel inlet for insertion of fuel into the heating unit, and (3) a lip to extend the top above the water level and to divide the top wall from the fuel inlet, the fuel inlet extending from the lip to the other end wall,
a baffle spaced from the end wall of the fuel inlet and extending laterally the width of the heating unit, the baffle extending downwardly over one-half the depth of the heating unit to divide the fuel inlet and to define, in conjunction with the end wall and sidewalls of the heating unit, an air inlet, and
a lid positioned over the air and fuel inlets adjustable to regulate the amount of combustion air entering the heating unit.

4,455,998

SOLAR COLLECTOR

Wiggert Kroontje, and Gijsbert Kuus, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 13, 1981, Ser. No. 321,298
Claims priority, application Netherlands, Dec. 4, 1980, 8006608
Int. Cl.³ F24J 3/02
U.S. Cl. 126—433 2 Claims



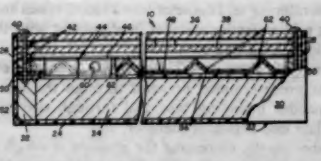
1. A solar collector which comprises an evacuated transparent envelope; an absorber arranged within said envelope; a duct arranged at least partially within said envelope and containing a heat-transport medium, said absorber being associated with said duct so as to transfer heat derived from incident solar radiation to the heat-transport medium in said duct during operation; a reversible heatable hydrogen getter positioned in said envelope and consisting of a partial hydride of one or more of titanium, zirconium, hafnium, scandium, yttrium, lanthanum, the rare earths, strontium, barium, vanadium, niobium, tantalum, thorium, and alloys of said metals; and a fully hydrogenized metal hydride also positioned in said envelope and being thermally more stable and having a higher affinity for oxygen than said partial hydride.

4,455,999

SOLAR HOT-WATER HEATERS

Ingenuin Heckenbleikner, West Cornwall, Conn. 06796

Filed Jul. 20, 1981, Ser. No. 285,421
Int. Cl.³ F24J 3/02
U.S. Cl. 126—445 12 Claims



1. A solar collector for collecting solar energy from the sun and exchanging that energy to a liquid heat exchange medium

comprising an outer housing having side, end and bottom walls, insulation means for insulating the side, end and bottom walls, a closed medium chamber assembly consisting of spaced apart upper and lower sheets enclosed by said side and end walls, and header means positioned on opposite sides of said closed medium chamber assembly for directing the liquid heat exchange medium to and from said closed medium chamber assembly, respectively, pump means for circulating said liquid heat exchange medium to and from said header means and through said closed medium chamber assembly under a predetermined pressure, wherein said upper sheet consists of a thin metal sheet about 1/64th of an inch thick and said lower sheet consists of a thin plastic sheet which includes a plurality of spaced apart rib means extending upwardly from and along the surface of said lower sheet from one side to the other for supporting said upper sheet and for defining between the metal and plastic sheets a plurality of flow paths for the medium through said closed medium chamber assembly, said rib means having a height that can vary from about 1/16th of an inch to about $\frac{1}{4}$th of an inch, said lower sheet further including means for defining a plurality of shallow, downwardly directed grooves extending between said rib means and normally thereto and across the bottom of each of said plurality of flow paths.

4,456,000

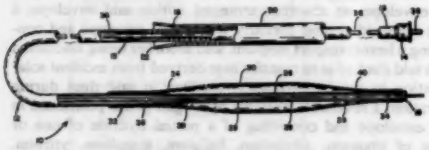
EXPANDABLE OCCLUSION APPARATUS

Gilmore T. Schjeldahl, Minnetonka, Minn., and B. Sharma, Springfield, Ill., assignors to Angiomedics Corporation, Minneapolis, Minn.

Division of Ser. No. 293,466, Aug. 17, 1981, Pat. No. 4,413,989, which is a continuation-in-part of Ser. No. 185,273, Sep. 8, 1980, abandoned, which is a continuation-in-part of Ser. No. 47,353, Jun. 11, 1979, abandoned. This application Aug. 24, 1983, Ser. No. 525,943

Int. Cl.³ A61B *19/00*; A61M *25/00*

U.S. Cl. 128—1 D **4 Claims**



1. A method of treating stenotic lesions in blood vessels comprising:

(a) collecting a supply of the patient's blood;

(b) providing a catheter having an elongated outer expander mounting tube, an inner pressure sensing tube disposed in the lumen of said outer expander tube, a flexible inelastic tubular expander member sealingly affixed at the opposed ends thereof to the outer surface of said expander mounting tube proximate the distal end of said catheter, there being a pattern of apertures formed through the side walls of said expander tube in the zone between said opposed ends of said flexible, inelastic expander member;

(c) introducing said catheter into a blood vessel and positioning said expander member in alignment with the stenotic lesions to be treated;

(d) pumping the patient's own blood from said supply, at a first predetermined pressure through the lumen of said expander mounting tube and through said apertures to inflate said expander member; and

(e) subsequently increasing the pressure at which said blood supply is being pumped to dilate said lesion while simultaneously controlling the rate of flow of blood out from the distal end of said catheter.

4,456,001

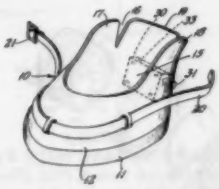
APPARATUS FOR EQUINE HOOF TREATMENT

Eugene A. Pescatore, Elmwood Park, N.J., assignor to Electro-Biology, Inc., Fairfield, N.J.

Filed Jul. 2, 1982, Ser. No. 394,691

Int. Cl.³ A61N *1/40*

U.S. Cl. 128—1.5 **10 Claims**



1. An electromagnetic body-treatment device for surgically non-invasive modification of the growth repair and maintenance behavior of living tissues and/or cells within an equine hoof by a specific and selective change in electrical environment, comprising a boot of magnetically transparent material and having a relatively stiff sole portion and a relatively flexible upper portion peripherally connected to the sole portion, the upper portion being shaped for removable conforming application to hoof side contour, the bottom of said sole portion being characterized by an integral downward projection of horseshoe shape and with a multi-turn electrical coil embedded in the horseshoe region of said sole portion, the turns of said coil being generally in the horizontal plane of said sole portion and defining a magnetically transparent included area in substantial conformance with that of the bottom area of the hoof, whereby said coil is poised to establish an upstanding axis of symmetry of magnetic-flux concentration in the hoof, and self-contained means carried by said boot and connected to said coil for electrically exciting said coil with a succession of low-voltage unidirectional asymmetrical pulses.

4,456,002

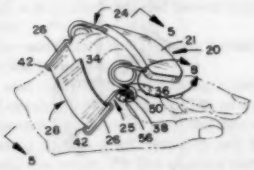
SPRING METACARPOPHALANGEAL FLEXION SPLINT (KNUCKLE SPLINT)

Lois M. Barber, Pismo Beach, and William H. Jackson, Atascadero, both of Calif., assignors to L M B Hand Rehab Products, San Luis Obispo, Calif.

Filed Sep. 27, 1982, Ser. No. 424,202

Int. Cl.³ A61F *5/10*

U.S. Cl. 128—77 **12 Claims**



1. A spring metacarpophalangeal flexion splint comprising:

a cushioned manually bendable proximal phalangeal piece adapted to contact, cover and follow the curve of the proximal interphalangeal joints of the hand;

a palm piece adapted to fit into the palmar arch and palmar crease of the hand and including a substantially rigid tube covered with a pliant cushioning material;

a pair of spaced spring wires, connecting said proximal phalangeal piece and said palm piece and which are disposed generally laterally with respect to the hand and providing spring tension between said proximal phalangeal and palm pieces to force said proximal phalangeal and

palm pieces together, each of said spring wires having a projection extending from said palm piece;

strap attachment means on the ends of said projections; and,

an adjustable dorsal strap between said strap attachment means to permit increase and decrease of tension of the spring metacarpophalangeal flexion splint upon the respective tightening and loosening of said strap.

4,456,003

KNEE JOINT ORTHOSIS

Paul L. Allard, Montreal, and Jacques R. Sibille, Ottawa, both of Canada, assignors to The Muscular Dystrophy Association of Canada, Toronto, Canada

Filed Mar. 3, 1982, Ser. No. 354,190
Claims priority, application Canada, Jan. 29, 1982, 395257
Int. Cl.³ A61F 3/00
U.S. Cl. 128—80 F **7 Claims**

1. A knee-joint orthosis for persons whose legs are weak or unstable, comprising:

a first elongate member adapted to be secured along the lower leg below the knee,

a second elongate member adapted to be secured along the upper leg above the knee, the two elongate members being hinged together at a pivot location which, when the elongate members are secured to the leg, can be substantially aligned with the hypothetical pivot axis between the upper and lower leg,

and a tension member secured between a first location which moves with said first member and a second location which moves with said second member, the force of the tension member acting along a line which is spaced from the pivot location and which is such that tension in said tension member increases as the leg is flexed, whereby the moment acting to extend the leg increases as the leg is flexed,

the second location being on a cog member pivoted about said pivot location, said second location being spaced from said pivot location, the second elongate member including means for rotating the cog member along with the second elongate member about said pivot location,

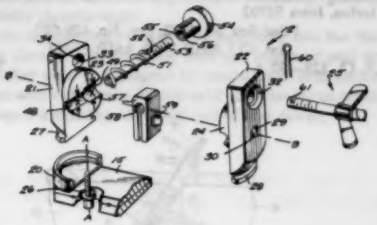
said means including a dog pivoted to the second elongate member, the dog being pivotally mounted to move between (a) a first position in which it bears against said cog member and rotates the same along with the second elongate member, and (b) a second position in which it frees the cog member for movement independent of said second elongate member.

4,456,004

FRACTURE HOLDING

Charles H. Kenny, 276 South St., Pittsfield, Mass. 01201

Filed Jul. 21, 1981, Ser. No. 285,600
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 A **21 Claims**



1. An external fixation assembly for stabilizing a fractured bone in a living body to facilitate proper healing at the fracture site, comprising:

a plurality of pins for penetrating each portion of a fractured bone; and

means for stabilizing the position of said pins externally of the body so that the bone portions are maintained in proper healing position, said means comprising mechanical means for applying compression and for providing for the simultaneous application of axial loading to the fracture site, said stabilizing means comprising a plurality of universal joint means; a plurality of articulation coupling means; a plurality of rod means for operatively interconnecting said pins, universal joint means, and articulation coupling means, including a rod received by each universal joint means and interconnecting said universal joint means to an articulation coupling means; and spring means for applying a predetermined defined compressive force directly to at least one of said plurality of universal joint means, acting between said universal joint means and said rod received thereby, so that the bone portions are held together by the compressive force of said spring means.

21. An external fixation assembly for stabilizing a fractured bone in a living body to facilitate proper healing at the fracture site, comprising:

a plurality of pins for penetrating each portion of a fractured bone; and

means for stabilizing the position of said pins externally of the body so that the bone portions are maintained in proper healing position, said means comprising mechanical means for applying compression and for providing for the simultaneous application of axial loading to the fracture site, said stabilizing means comprising a plurality of universal joint means; a plurality of articulation coupling means; a plurality of rod means for operatively interconnecting said pins, universal joint means, and articulation coupling means; and spring means for applying a predetermined defined compressive force directly to at least one of said plurality of universal joint means so that the bone portions are held together under force; the improvement comprising a said universal joint means which comprises:

a pair of rod-receiving discs each mounted between two rotatable half-clamp members; each of said discs having a rod-receiving substantially semicircular slot formed therein; said discs being pivotally positionable so that said slots are generally alignable in opposition so as to form a substantially cylindrical opening between said clamp members; said opening having a first portion of a diameter x, and a second portion of a diameter X, wherein X, is greater than x; said spring means comprising a coil spring received in said opening second portion and abutting an interface between said opening first and second portions at a first end thereof and an abutment carried on said rod at

a second end thereof, thereby applying a spring force to said universal joint at said interface.

4,456,005

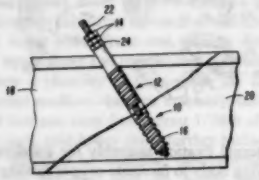
EXTERNAL COMPRESSION BONE FIXATION DEVICE

Terry K. Lichty, Suite 105, St. Francis Professional Bldg., Waterloo, Iowa 50702

Filed Sep. 30, 1982, Ser. No. 429,027

Int. Cl.[3] A61F 5/04; A61B 17/18

U.S. Cl. 128—92 A 7 Claims



1. An external compression bone fixation device for the treatment of bone fractures, said device comprising a distal member having an externally threaded body and a shaft of a smaller diameter than the body, a proximal member having an externally threaded body and an opening extending axially through the body which opening is of a larger diameter than the shaft of the distal member, and means combined with each of the distal and proximal members to provide for turning of said distal and proximal members so that the members can be threaded from one side into the bone on opposite sides of the fracture, said means extending at all times externally of the tissues covering the bone.

4,456,006

CONTRACTING BONE CLIP

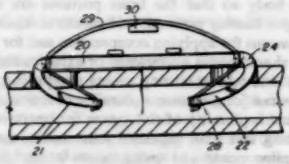
Henk W. Wevers; Charles Sorbie, both of Kingston, and Gerald A. B. Saunders, Sydenham, all of Canada, assignors to Queen's University at Kingston, Kingston, Canada

Continuation of Ser. No. 312,939, Oct. 20, 1981. This application Aug. 12, 1983, Ser. No. 522,513

Claims priority, application Canada, Nov. 10, 1980, 364395

Int. Cl.[3] A61F 5/04

U.S. Cl. 128—92 B 2 Claims



1. An endoprosthetic bone clip for joining bones in vivo under a selected compressive force, comprising:

an elongated metallic body member having coplanar, unilaterally extending single legs at each longitudinal end thereof; said legs being formed unitarily with and extending substantially perpendicular to said body member; said legs being adapted for insertion into respective predrilled holes in said bones joined; and including single wire means overlying said body member and having each end portion thereof extending through said body member adjacent the ends thereof so as to secure the ends of said wire means to a respective remote end of each of said legs for drawing the remote ends of said legs towards each other, imparting said selected force, and thereby joining said bones.

4,456,007

INHALER

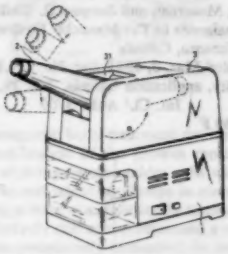
Shiaroku Nakao, Kanagawa; Yoshiyasu Ishii, and Kazuo Nagata, both of Tokyo, all of Japan, assignors to Combi Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 329,108

Claims priority, application Japan, Dec. 12, 1980, 55-178213[U]; Dec. 12, 1980, 55-178214[U]; Jan. 29, 1981, 56-11335[U]

Int. Cl.[3] A61M 11/04

U.S. Cl. 128—200.21 6 Claims



1. An inhaler comprising a body having a vapor producing unit therein, cover means detachably fitting on said body and having aperture means therein, a vapor feeding sleeve for directing a vapor into a user's mouth, and pivot means for pivotally mounting said vapor feeding sleeve on said cover means for movement between a first plurality of positions wherein said sleeve extends outwardly through said aperture means at a desired angle and a second position wherein said sleeve is disposed completely within said cover, said aperture means permitting pivotal movement of said sleeve between said first and second positions only when said cover means is removed from said body.

4,456,008

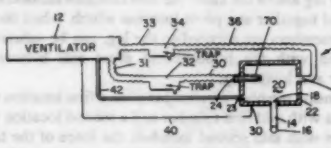
RESPIRATORY APPARATUS AND METHOD

Burrell E. Clawson, and James Weigl, 1833 3rd Street-C, both of Riverside, Calif. 92507

Filed Sep. 13, 1982, Ser. No. 417,226

Int. Cl.[3] A61M 16/00

U.S. Cl. 128—205.19 5 Claims



1. Respiratory apparatus for connection to a ventilator system such as to receive respiratory gas from said ventilator and to direct unused respiratory gas and exhaled gas back to said ventilator, said respiratory apparatus comprising:

a housing defining a chamber;

a gas inlet port in said housing opening to said chamber;

a gas outlet port in said housing opening to said chamber;

a respiratory port in said housing opening to said chamber;

aspiration means for reducing the pressure in said chamber as an incident to an increase in the rate of flow into said chamber at said inlet port;

an inlet flow conduit having one end connected to said inlet port;

an outlet flow conduit having one end connected to said outlet port;

said aspiration means being formed by a restriction at said inlet port which directs flow to said outlet port;

cyclically operable valve means for alternately completing and closing a pathway for gas through said outlet port and said outlet flow conduit;

said valve means comprising a valve disposed adjacent to said outlet port; and

said inlet and outlet conduits being concentric, the inlet conduit being disposed within the outlet conduit, and which comprises means for interconnecting the outlet flow conduit to the outlet port such that the outlet conduit may encompass the inlet conduit.

4,456,009

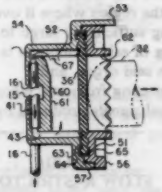
INTRAVENOUS PUMP CHAMBER ASSEMBLY

John L. Veelke, Zion; Jay J. Pisik, Deerfield, and Clive P. Hohberger, Glencoe, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jun. 30, 1980, Ser. No. 164,434

Int. Cl.³ A24D *1/18*

U.S. Cl. 604—152 **18 Claims**



1. An intravenous pump chamber assembly for an intravenous pump comprising:

a base member defining a central cavity portion;

a diaphragm member positioned over said cavity portion;

a retaining member defining a central opening to accommodate a plunger member, said base member and retaining member constructed and arranged to accommodate said diaphragm therebetween in a sealing relationship;

inlet and outlet ports defining inlet and outlet passages extending through said base member and in fluid communication with said central cavity portion, said inlet and outlet ports being positioned within the confines of said cavity portion to communicate with said central cavity portion and spaced from each other with said outlet port positioned adjacent the periphery of said cavity, said base member presenting a wall defining an air bubble deterring surface between said inlet and outlet ports;

tubing receiving means defined by said inlet and outlet ports; and

inlet and outlet flexible I.V. tubing in fluid-tight communication with said respective inlet and outlet ports.

4,456,010

CRANIAL DRILL

Harry G. Reimels, Braintree; Daniel G. Cerundolo, Dedham, and Roy W. Downing, Hingham, all of Mass., assignors to Codman & Shurtleff, Inc., Randolph, Mass.

Continuation-in-part of Ser. No. 200,725, Oct. 27, 1980, Pat. No. 4,362,161. This application Sep. 21, 1981, Ser. No. 304,426

Int. Cl.³ A61B *17/16*

U.S. Cl. 128—310 **17 Claims**

1. Apparatus for drilling bone structure comprising:

a generally cylindrical primary drill member having cutting surfaces at the distal end thereof and having a proximal end;

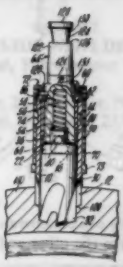
a generally cylindrical driver having a distal end disposed in confronting relationship to said drill member proximal end and having a proximal end;

a stem projecting from the proximal end of said driver and adapted for insertion into a drill chuck;

clutch means including a cylindrical stem projecting axially from the proximal end of said primary drill member and having a diameter less than the diameter of said primary drill member;

said cylindrical stem having a bore extending generally radially therethrough;

said driver including an axial bore extending into the distal end thereof a distance less than the height of said drill member stem and adapted to receive said drill member stem with a clearance fit, said axial bore leaving an annular flange surrounding the distal end of said driver;



a slot extending radially through said annular flange at the distal end of said driver in communication with said axial bore;

a pin extending into said stem radial bore and adapted to be received into said driver transverse slot when said driver and said drill member are coupled together; and,

whereby when said clutch is engaged, said pin engages said driver slot causing said drill member and said driver to rotate as a unit and drill into the bone structure and when said clutch is disengaged, said pin disengages from said slot causing said drill member to remain stationary as said drill rotates when the drill member penetrates through the bone structure.

4,456,011

BALLOON-CATHETER

Irene Warnecke, Heerstrasse 11, 1000 Berlin 19, Fed. Rep. of Germany

Filed Dec. 21, 1981, Ser. No. 332,929

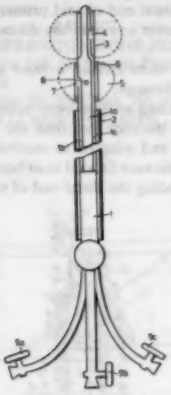
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1980, 3048923

Int. Cl.³ A61M *25/00*

U.S. Cl. 128—325 **12 Claims**

1. A balloon-catheter with a detachable occlusion member for intravascular and permanent occlusion of vascular connections and cardiac septal defects, the improvement, comprising, a position balloon disposed at the distal end of the catheter the position-balloon being connected to the catheter; an occlusion-balloon detachably mounted on the catheter at a particular distance from the position balloon and rearwardly displaced

from the distal end in a direction toward the other end of the catheter; and means for providing for filling and emptying of

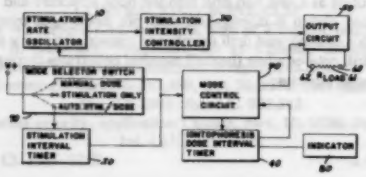


the balloons so that they can be separately filled and evacuated via separate lumina from the other end of the catheter.

4,456,012
IONTOPHORETIC AND ELECTRICAL TISSUE STIMULATION DEVICE

Gary A. Lattin, Forest Lake, Minn., assignor to Medtronic, Inc., Minn.

Filed Feb. 22, 1982, Ser. No. 351,104
Int. Cl.³ A61N 1/36
U.S. Cl. 128—420 R **21 Claims**



1. An electrotherapeutic device for use with electrodes adaptable for introducing iontophoretic substances and delivering electrical tissue stimulation to body tissue, comprising:

generating means operative in a first mode for producing electrical tissue stimulation and operative in a second mode for producing iontophoretic current;

a pair of output terminals for connection to electrodes, said output terminals connected to said generating means; and

means for controlling the mode of operation of said generating means for causing either iontophoretic current or electrical tissue stimulation to be delivered to the terminals for application to body tissue.

4,456,013
CATHETER

Danilo E. De Rossi, Pisa, Italy; Pierre M. Galletti, Providence, R.I., and Paolo Dario, Leghorn, Italy, assignors to Brown University Research Foundation, Providence, R.I.

Filed Sep. 8, 1981, Ser. No. 299,740
Int. Cl.³ A61B 5/02
U.S. Cl. 128—675 **15 Claims**

1. A catheter for measuring pressure fluctuations within the body, comprising

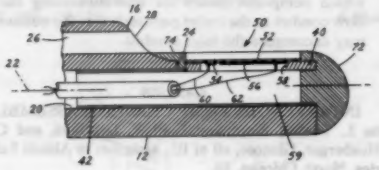
a tube having one end suitable for insertion into a body organ,

a transducer located at said end, said transducer comprising

a flexible piezoelectric polymeric membrane having an interior surface facing the interior of said tube and an exterior surface facing the exterior of said tube,

a pair of surface electrodes mounted on said membrane,

said tube end having a cavity,



said membrane being supported above said cavity at the periphery of the membrane so that said membrane is unsupported in the region where it overlies said cavity, and

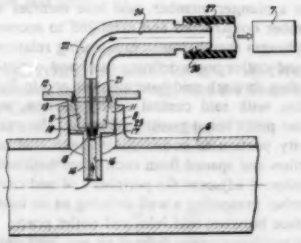
said cavity being sufficiently large to permit unobstructed inward flexing of said membrane in response to pressure fluctuations in said organ, and

means for transmitting from said electrodes to external circuitry electrical signals produced by said flexing.

4,456,014
FLOW RESTRICTOR

Keith E. Buck, Alamo; Irving C. Chase, El Sobrante, and Marius J. Morin, Westlake Village, all of Calif., assignors to Thoratec Laboratories Corporation, Berkeley, Calif.

Filed Jan. 3, 1983, Ser. No. 449,540
Int. Cl.³ A61B 5/08
U.S. Cl. 128—719 **6 Claims**



1. A flow restrictor for use with a gas analyzer comprising a conduit adapted to conduct respiration gases; an inlet tube extending within said conduit and defining an inlet volume; an outlet tube forming a junction with said inlet tube; and a capillary tube within said outlet tube, extending substantially to said junction and open at one end to said inlet tube and at the other end to said outlet tube.

4,456,015
NON-INVASIVE METHOD FOR SEMIQUANTITATIVE MEASUREMENT OF NECK VOLUME CHANGES

Marvin A. Sackner, Miami Beach, Fla., assignor to Respitrace Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 266,850, May 26, 1981. This application Apr. 2, 1982, Ser. No. 364,710
Int. Cl.³ A61B 5/08
U.S. Cl. 128—721 **5 Claims**

1. A method of semiquantitatively measuring a subject's neck volume comprising:

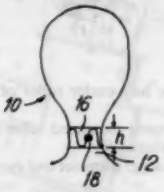
providing an extensible conductor in the form of a loop having a predetermined height;

providing a signal variably responsive in value to changes in the inductance of the conductor;

calibrating the signal by determining reference signal values obtained with the conductor disposed about at least two known volumes and using said reference signal values to establish the relationship between signal value and the volume enclosed by the conductor;

disposing said conductor in close encircling relation about the subjects's neck;

calibrating said signal for intrapleural pressure by using an invasive technique as a reference for determining a plurality of intrapleural pressures for said subject, and simultaneously determining the signal value for each such intrapleural pressure measurement, thereby establishing the relationship between intrapleural pressure and signal value;



discontinuing the reference technique;

determining the signal value with the subjects's airway closed;

correlating said closed airway signal value with intrapleural pressure based on said established relationship between intrapleural pressure and signal value; and

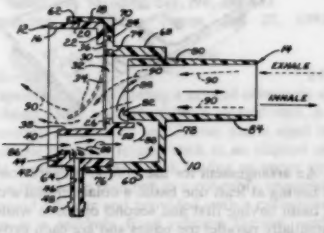
correlating intrapleural pressure obtained in accordance with the previous step with the volume enclosed by the conductor based on the established relationship between signal value and enclosed volume.

4,456,016

INHALATION VALVE

Christopher Nowacki, Arlington Heights, and Alfred S. Brisson, Schaumburg, both of Ill., assignors to Trutek Research, Inc., Arlington Heights, Ill.

Filed Jul. 1, 1982, Ser. No. 394,403
Int. Cl.³ A61B 5/08
U.S. Cl. 128—725 **12 Claims**



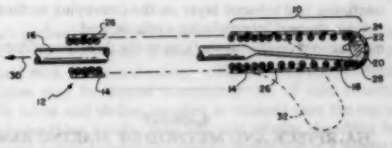
1. An inhalation valve comprising a body, a mouthpipe for insertion in a person's mouth, said mouthpipe being connected to said body and having an air passageway therethrough, said body having an exhalation air passageway therethrough in substantial alignment with said mouthpipe air passageway, diaphragm valve means disposed in said body between and in substantial alignment with said passageways said diaphragm valve means deflecting for permitting free, straight-through exhalation from said mouthpipe through said exhalation passageway but closing for preventing straight-through inhalation therethrough, means in said body providing an inhalation air passageway substantially parallel to and displaced laterally of said mouthpipe air passageway and in air flow communication therewith, said inhalation air passageway communicating with said mouthpipe air passageway such that no exhalation air will flow thereinto, both said exhalation air passageway and said inhalation air passageway being open to atmosphere at a common end opposite to said mouthpipe, said inhalation air passageway having a restriction therein, and means providing a pneumatic connection downstream of said restriction in the direction of inhalation air flow for measuring a function of the pressure drop produced at said restriction.

4,456,017

COIL SPRING GUIDE WITH DEFLECTABLE TIP

Marshall Miles, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.

Filed Nov. 22, 1982, Ser. No. 443,204
Int. Cl.³ A61M 25/00
U.S. Cl. 128—772 **6 Claims**



1. A coil spring guide for use in connection with the insertion of a catheter into the vessel of a body, said guide comprising a coil spring, a core wire within said coil spring extending the length of said coil spring, a head member, means for coupling said head member to the distal end of said core wire, the coils in the distal end portion of said coil spring being spaced from each other and the distal end of said coil spring engaging the backside of said head member, means coupled to the proximal end of said coil spring and of said core wire for causing movement of said core wire relative to said coil spring, a sheath of smooth plastic material completely surrounding said coil spring and having a closed distal end completely covering said head member, said coupling means including a distal, reduced-in-cross-section core wire portion fixed to and extending from said core wire to said back side of said head member and fixed to said back side of said head member at and adjacent to a lateral side thereof whereby rearward movement of said core wire causes compression of said distal end portion of said coil spring and lateral movement thereof to one side of said center line of said coil spring and in a direction outwardly from the lateral side of said head member to which said distal core wire portion is fixed.

4,456,018

FEEDING TOBACCO CUTTING MACHINES

Warren A. Brackmann, and Stanislav M. Snaidr, both of Mississauga, Canada, assignors to Rothmans of Pall Mall Canada Limited, Don Mills, Canada

Continuation-in-part of Ser. No. 215,006, Dec. 10, 1980, Pat. No. 4,369,797. This application May 24, 1982, Ser. No. 381,213
Int. Cl.³ A24B 3/00, 7/08, 7/12
U.S. Cl. 131—116 **12 Claims**

1. In a method of forming cut tobacco shreds by forming a layer of tobacco in whole leaf or threshed lamina form on a conveying surface, the tobacco in said layer being oriented substantially planarly of the layer, being interleaved and being substantially uniformly distributed across the layer; densifying the tobacco layer by applying gravitational and vibrational forces only thereto while simultaneously conveying said tobacco towards the downstream end of said conveying surface without substantially altering the orientation and juxtaposition

of the tobacco in said layer; feeding the densified layer onto the lower one of a pair of upper and lower converging conveying surfaces without substantially altering the orientation and juxtaposition of the tobacco in said densified layer; compacting the fed tobacco layer between the converging upper and lower conveying surfaces while conveying the same towards the downstream end of said upper and lower converging conveying surfaces; and cutting tobacco shreds from the forward end of the compacted tobacco layer at the downstream end of the converging conveying surfaces, the improvement which comprises:

confining said tobacco layer on the conveying surface at the sides thereof by confining surfaces, and

moving said confining surfaces in the direction of movement of said tobacco layer.

4,456,019

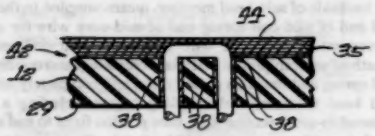
HAIRPIECE AND METHOD OF MAKING SAME

Paul V. Finamore, Chicago, Ill., assignor to Hairline Creations, Inc., Chicago, Ill.

Continuation of Ser. No. 347,622, Feb. 10, 1982, abandoned. This application May 18, 1983, Ser. No. 494,695

Int. Cl.³ A41G *3/00*

U.S. Cl. 132—5 **3 Claims**



1. A method for making a disassemblable hairpiece comprising: preforming a thin, flexible sheet member of polyester-based thermoplastic polyurethane film to have a predetermined contour; cutting said sheet member to have peripheral dimensions conforming substantially to a predetermined surface of a head of a user, said sheet member including inner and outer surfaces; forming a plurality of apertures through the sheet member at adjacent positions; inserting at least one strand of hair through each of said apertures, said hair extending from the outer surface of said sheet member so as to afford in the aggregate the appearance of natural hair, each aperture and at least one strand inserted therein defining at least one microscopic space therebetween; permeating said microscopic spaces with a low-viscosity, penetrating anaerobic cyanoacrylate adhesive to secure the hair strands in place; curing said adhesive; applying a solvent to the surface of the cured adhesive to activate said surface; applying at least one removable layer of a polyester-based, aliphatic polyurethane to the inner surface of the sheet member; and curing the layer at room temperature for at least 2 hours thereby forming a smooth coating on said inner surface, the coating being sufficiently thin to appear substantially transparent, said coating initially being irremovably bonded to said sheet member, and subsequently solvent removing the coating and the adhesive from said sheet member by application thereto of an effective amount of a solvent.

4,456,020

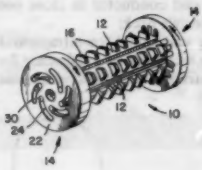
ADJUSTABLE HAIR CURLER

Gary E. van Deursen, Upper Saddle River, N.J., assignor to General Electric Company, New York, N.Y.

Filed Dec. 19, 1983, Ser. No. 563,091

Int. Cl.³ A45D *2/00*

U.S. Cl. 132—34 C **7 Claims**



1. An adjustable hair curler roller of general spool-shape comprising,

a pair of telescoping elongated tubes axially and rotatably movable therebetween,

a pair of nested larger diameter end caps secured at each end of each tube,

each pair including a first cap having a plurality of spiraled cam slots radiating from the center

a second nesting cap having a plurality of corresponding straight cam slots radiating from the center

said nesting caps rotatable relative to each other,

a plurality of toothed elongated curler segments extending between said end caps with means at each end cooperating with all said slots whereby,

on rotation of each first cap relative to the second, said segments are radially cammed to change the roller diameter.

4,456,021

SINK WITH COLANDER

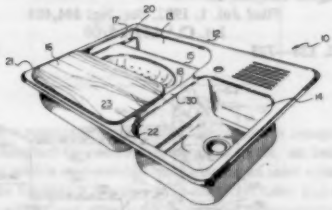
William H. Leavens, Midland, Canada, assignor to Waltec, Inc., Midland, Canada

Filed Sep. 24, 1982, Ser. No. 422,658

Claims priority, application Canada, Feb. 22, 1982, 396730

Int. Cl.³ B08B *3/04*

U.S. Cl. 134—85 **6 Claims**

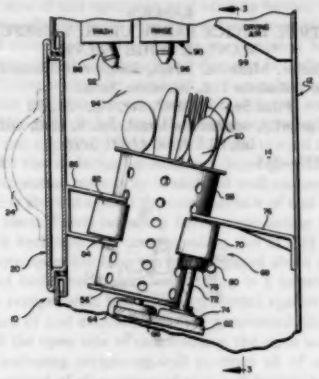


1. An arrangement for use in food preparation comprising a sink having at least one basin, a colander and a cutting board, said basin having first and second opposite walls which have substantially parallel top edges and are each provided with an inwardly extending rail parallel with the top edge and a predetermined distance below it, the colander having parallel opposite ends which rest on the rails, the colander being slidable along the rails, the cutting board having parallel opposite end portions which overlie the top edges of said two opposite walls and a main portion extending between the end portions and extending downwardly below the top edges of the walls a distance less than said predetermined distance whereby the cutting board and colander are independently sidable between third and fourth walls joining said first and second walls.

4,456,022
FLATWARE WASHING MACHINE

Donald E. Roberts, 4250 Saratoga Ave., Downers Grove, Ill. 60515

Continuation-in-part of Ser. No. 311,998, Oct. 16, 1981. This application Jan. 5, 1983, Ser. No. 432,652
Int. Cl.³ B08B 3/02
U.S. Cl. 134—99 18 Claims



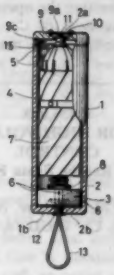
1. Flatware washing apparatus comprising: rotatable platform means adapted to receive and support a cylindrical cup for holding a plurality of flatware pieces in loosely shocked, substantially upright condition; mounting means for disposing said platform means at an angle inclined from the horizontal whereby the flatware pieces tend to cascade under gravitational influence upon rotation of said cup; drive means for causing rotation of said cup about its own individual axis; first spray means including first nozzle means positioned to direct jets of washing and sanitizing fluid into the path of the cascading flatware pieces generally downhill from the apogee of their orbiting transit; and second spray means including second nozzle means positioned to direct jets of rinse fluid into the path of the orbiting flatware pieces apart from the path of the jets of washing fluid.

4,456,023
COLLAPSIBLE UMBRELLA WITH WATER-TIGHT SHEATHING HANDLE

Norikazu Fujihashi, 1-27, Kumoicho, Nishinomiya, Hyogo, 662, Japan

Filed Jul. 14, 1982, Ser. No. 398,222
Claims priority, application Japan, Jul. 25, 1981, 56-110734[U]
Int. Cl.³ A45B 19/00
U.S. Cl. 135—25 R 2 Claims

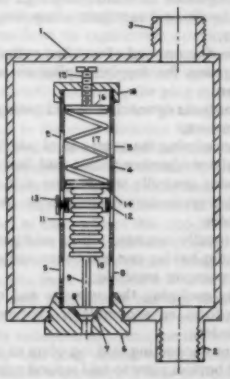
1. A collapsible umbrella having a central telescopic stick, a radiating folding frame partially slidable on said stick, a circular fabric canopy fastened to said frame, and a rigid tubular sheathing handle attached to said stick in an aligned relation thereto, said central telescopic stick having an upper end provided with a round cap member in a rotatably engaging relation thereto and a lower end provided with a cylindrical sliding member in a securely fixed relation thereto, said rigid tubular sheathing handle having an open top end, a closed bottom end and a cylindrical inner side wall, said sliding member having a plurality of tongue members in radiating relation thereto being slidably movable within said sheathing handle in an inserted relation thereto, the inner side wall of said sheathing handle being provided with axial grooves to guide said sliding member axially between the bottom end and top end of said sheathing handle in slidably engaging relation with the tongue members and spiral grooves offsetting ascendingly from said axial grooves near the top end of the sheathing handle to retain said sliding member at said near top end of said sheathing handle so that said stick, frame and canopy altogether in a fully collapsed condition may be withdrawn in said sheathing handle when said sliding member is at the bottom end of said sheathing handle, that said sheathing handle may form a completely closed and water-tight hollow cylindrical casing just large enough to enclose said stick, frame and canopy altogether in a fully collapsed condition when the top end of said sheathing handle is closed with said cap member, and that said stick, frame and canopy altogether in a fully collapsed condition may be almost completely out of said sheathing handle when said sliding member is retained near the top end of said sheathing handle, whereby said tubular sheathing handle serves a dual purpose as a storing sheath and as a handle for the umbrella.



4,456,024
FREEZE PROTECTION VALVE ASSEMBLY

John I. Roberts, P.O. Box 83, Dickinson, Tex. 77539

Filed Jan. 17, 1983, Ser. No. 458,192
Int. Cl.³ E03B 7/12
U.S. Cl. 137—62 1 Claim



1. A freeze protection valve assembly comprising, in combination, (1) a reservoir having an inlet fitting to attach said reservoir to a segment of pipe of a water supply system and an outlet fitting to which can be attached a faucet permitting normal use of the water supply, said inlet and outlet fittings being positioned such that when attached to said water supply system the reservoir is maintained full of water when the outlet to the reservoir is closed, and (2) a valve disposed through the wall of the reservoir above the bottom of the reservoir, said valve comprising a unitary assembly of a valve body having a seat, a valve member movably disposed to engage said seat, an

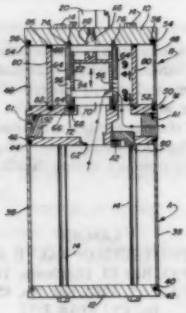
expandable chamber containing a liquid which expands in volume as the temperature increases and contracts as the temperature decreases resulting in the chamber extending as the temperature increases and retracting as the temperature decreases, a driving connection between said chamber and said valve member, lost motion means to maintain said valve member in said seat as the chamber extends or retracts with changing temperatures above a selected minimum temperature, and adjustable stop means limiting the operation of the lost motion means permitting adjustment of the minimum temperature above which the lost motion means maintains said valve member in said seat.

4,456,025

REGULATOR FOR HIGH VOLUME AIR FLOW CONTROL

Willard D. Childs, 582 Rancho Santa Fe Rd., Encinitas, Calif. 92024

Filed Dec. 28, 1981, Ser. No. 335,081
Int. Cl.³ G05D *16/10*
U.S. Cl. 137—115 **12 Claims**



1. A pressure regulator for controlling high volume air flow at low pressure levels, said regulator comprising:

a first cylinder;

a top plate covering one end of said first cylinder and including a passageway for supplying pilot air pressure within said cylinder;

a pressure transducer connected to said passageway to sense the pilot pressure;

a manifold plate closing the other end of said first cylinder to form a regulator chamber within said first cylinder;

a piston cylinder centrally mounted in said first chamber, said passageway communicating with the top of said piston cylinder;

a piston reciprocally mounted within said piston cylinder;

a second cylinder having one end connected to the opposite side of said pressure manifold;

a bottom plate enclosing the opposite end of said second cylinder to form an accumulator chamber within said second cylinder;

fastening means connecting said top plate to said first cylinder and said bottom plate to said second cylinder with said manifold plate between said cylinders;

at least one opening in said cylinder wall which is selectively opened and closed by movement of said piston;

a first port means in said manifold plate extending from said accumulator chamber to the peripheral edge of said manifold plate for connection to a plenum;

a second port means in said manifold plate extending from said accumulator chamber to the periphery of said manifold plate opposite said port from said first port means and connectable to a pressure pump;

a central opening aligned with said piston cylinder extending through said manifold plate centrally thereof, to permit flow of air in said accumulator chamber into said piston cylinder on the side of said piston opposite the pilot air pressure; and

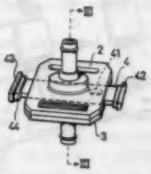
a third port means in said manifold plate extending from said opening in said cylinder wall to the peripheral edge of said manifold plate to vent said accumulator chamber to atmosphere when said piston moves to a position to open at least a portion of said opening in said piston cylinder wall.

4,456,026

CONTROL DEVICE PARTICULARLY USEFUL AS MANUAL SLIDE VALVE

Itzhak Kantor, Menashe, Israel, assignor to Plasson Maagan Michael Industries Ltd., Menashe, Israel

Filed Sep. 30, 1982, Ser. No. 431,190
Claims priority, application Israel, Jul. 8, 1982, 66276
Int. Cl.³ F16K *43/00, 3/16*
U.S. Cl. 137—315 **11 Claims**



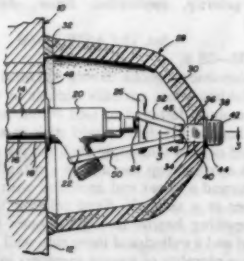
1. A control device including a housing and displaceable control member movable within the housing, characterized in that said housing is constituted of two sections each being formed with interlocking elements including a projection projecting from one side of the displaceable member and a depression formed in the opposite side of the displaceable member, the projection of one section being co-operable with the depression of the other section, and with said displaceable control member, such that when the latter member is disposed within the housing, said housing sections are interlocked with it and with each other against separation, and when the displaceable control member is removed from said housing, said housing sections may be separated from each other.

4,456,027

HOSE BIB COVER

Truly M. Belgard, P.O. Box 9031, Ft. Worth, Tex. 76107

Filed Jul. 16, 1982, Ser. No. 398,837
Int. Cl.³ F16K *51/00*
U.S. Cl. 137—375 **3 Claims**



1. In combination with a building exterior wall having an opening formed therethrough, a water supply pipe extending through said opening and having a hose bib supported upon its outer end equipped with a hand wheel and a laterally directed water outlet neck, a hose bib cover for insulating said hose bib from below freezing exterior temperatures, said cover includ-

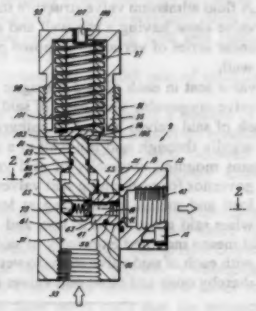
ing an open-sided cup-shaped housing disposed over said hose bib, constructed of heat insulative material and with the open side of said housing opposing the outer surface of said wall, being genrally oval in shape and including major and minor axes, resilient and compressible seal structure extending about said open side, facing outwardly therefrom and abutted against said outer surface, said housing including an outer end wall centered relative to and of a plan area smaller than the cross-sectional area of said open side, said housing further including peripheral walls divergent from said end wall toward said open side, said outer end wall including an elongated blade-type anchor extending therethrough and disposed in a plane generally paralleling said major axis, said anchor including an inner end portion projecting inwardly of said end wall and having opposite side edge slots formed therein spaced inwardly of said end wall and oppositely outwardly inclined toward the latter, said anchor also including an outer end finger grip defining tab portion projecting outwardly of said end wall and an enlarged mid-portion abutted against the outer surface of said end wall, a pair of elastic bands including first corresponding loop portions each anchored in a corresponding slot of said slots and second corresponding loop portions engaged about said hand wheel and outlet neck, said bands being in a tensioned state with said compressible seal structure abutted against the exterior surface of said exterior wall and compressed between the latter and the open side of said housing, the open side of said housing including peripheral wall portions all of which are spaced outward of all portions of said wall horizontally registered with said hose bib.

4,456,028

RELIEF GATE VALVE

Richard R. Watson, Cypress, Tex., assignor to Gilmore Valve Company, Bellaire, Tex.

Filed Sep. 4, 1981, Ser. No. 299,555
Int. Cl.³ F16K 17/26
U.S. Cl. 137—493 **14 Claims**



1. A gate valve comprising,

a body having an axial passage and a lateral passage transecting the axial passage interiorly of the body, the outer ends of the axial and lateral passages providing an inlet and outlet respectively, the inner end of the lateral passage providing a valve seat,

a closure axially movable in the axial passage between a valve closed position blocking flow through the lateral passage and a valve open position in which flow through the lateral passage is possible,

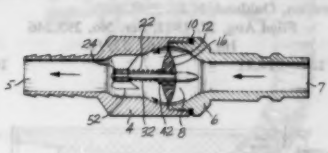
said closure including a gate adapted to close the lateral passage in the valve closed position, a pressure spring urging the gate against the valve seat, and a ball transferring the spring reaction to the wall of the axial passage.

4,456,029

TWO-WAY FUSE FOR A FLUID LINE

Russell C. McCrum, Maple Valley, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 12, 1982, Ser. No. 357,473
Int. Cl.³ F16K 17/26
U.S. Cl. 137—498 **1 Claim**



1. A two-way fuse for use in a fluid line, comprising:

a housing with an axial flow passageway that includes a bulbous chamber; said chamber being circular in cross section along its entire axial length; and said chamber having a sidewall that is smoothly curved in the axial direction, an inlet end, an outlet end, and cross-sectional diameters that increase in a smooth curve from a predetermined diameter at the inlet end to a maximum diameter at an axially intermediate portion of the chamber and that decrease in a smooth curve from said maximum diameter at said intermediate portion to said predetermined diameter at the outlet end;

plug means comprising a circular plug that is concentric with the axis of the flow passageway and that has a circumferential periphery with a maximum diameter substantially equal to said predetermined diameter; said plug means having a first closed position in which said periphery seats against the sidewall of the chamber at the outlet end, a second closed position in which said periphery seats against said sidewall at the inlet end, and an equilibrium position that is axially between said first and second closed positions and in which there is an annular flow passageway defined between said periphery and said sidewall;

spring means for biasing the plug means toward its equilibrium position; said spring means resisting movement of the plug means from its equilibrium position toward its first closed position; and said plug means being free to move toward its second closed position; and

mounting means for mounting the plug means and the spring means in the housing and for guiding movement of the plug means in the axial direction between its equilibrium position and its first and second closed positions;

wherein said housing includes means for blending said sidewall of the chamber into the fluid line;

wherein the spring means is positioned at said outlet end and is preloaded to exert a force that opposes movement of the plug means from its equilibrium position toward its first closed position; said plug means being in its equilibrium position when there is a normal flow of fluid through the fluid line, said plug means moving from its equilibrium position to its first closed position when the flow becomes sufficiently excessive to overcome the force of the spring means, and said plug means moving freely to its second closed position when there is flow of fluid in the fluid line in a direction opposite to the normal direction of flow;

wherein the mounting means comprises a circular center hole extending axially through the plug; a T-shaped positioner having a longitudinal shaft, a flat circular head, and a longitudinal passageway extending concentrically through the shaft and the head; and a concentric rod that is received into said center hole and said longitudinal passageway and along which the plug slides axially;

wherein the spring means comprises a coil spring with spirals through which the rod extends;

wherein the rod has a circumferential shoulder thereon, formed by an enlarged diameter portion of the rod; and

wherein when the plug means is in its equilibrium position,

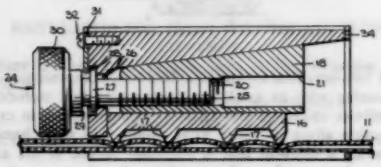
the shaft abuts against the shoulder, the head abuts against the coil spring to preload said spring, and the center hole in the plug slidingly receives the shaft.

4,456,030

LINEAR METERING VALVE FOR TUBES

Armen Bogosian, Teaneck, N.J., assignor to Flow Technology Corporation, Oakland, N.J.

Filed Aug. 17, 1981, Ser. No. 293,246
Int. Cl.³ F16L 55/14
U.S. Cl. 137—614.11 16 Claims



1. A linear metering valve for flexible tubing comprising

housing defining a longitudinal passageway having a reduced portion for slidably receiving a flexible tubing therein;

a bar means movably disposed in said passageway of said housing, said bar means having a plurality of longitudinally spaced protuberances thereon sized to fit into said reduced portion for engaging the tubing passing through said housing passageway; and

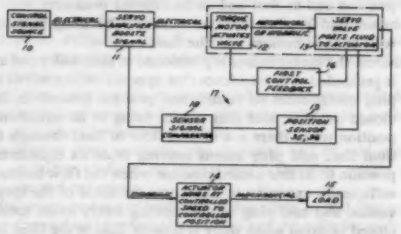
means for moving said bar means longitudinally and transversely within said passageway of said housing for selectively opening and closing the tubing to control the velocity of a fluid therethrough.

4,456,031

ELECTRO-HYDRAULIC SERVO VALVE SYSTEM

Lael B. Taplin, Union Lake, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed May 3, 1982, Ser. No. 374,012
Int. Cl.³ F15B 13/043
U.S. Cl. 137—625.62 10 Claims



1. An electro-hydraulic servo valve system comprising

a two-stage spool type servo valve including a first stage comprising an electrical force motor and a second stage including a spool for controlling flow to an actuator,

said force motor being operable upon receipt of a command electrical signal to move the spool,

first feedback means operable to cause the force motor to stop the movement of the spool at a predetermined position,

second feedback means operable to stop the movement of the spool at a predetermined position,

said second feedback means having a greater gain than said first feedback means so that said second feedback means normally dominates the system,

said second feedback means comprising a pair of identical electrical sensors connected in parallel,

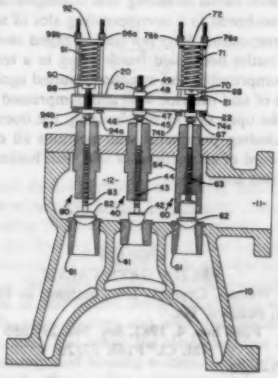
and means for comparing the electrical signals from said sensors and operable when the signals deviate from one another by a predetermined amount to disable the second feedback means so that the first feedback means will function permitting the electro-hydraulic servo valve system to operate without the second feedback means.

4,456,032

FLUID ADMISSION VALVE STRUCTURE

William A. Straslicka, Norvelt, Pa., assignor to Elliott Turbomachinery Company, Inc., Jeannette, Pa.

Filed Jan. 18, 1982, Ser. No. 340,427
Int. Cl.³ F16K 1/00
U.S. Cl. 137—630.19 7 Claims



1. A fluid admission valve structure for a turbine comprising:

a valve chest having a top wall and a bottom wall;

a linear series of vertically disposed passages in said bottom wall;

a valve seat in each of said passages;

a valve cooperable with each of said valve seats;

each of said valves having an integral stem extending outwardly through said top wall in a sliding relationship;

means mounted externally of said valve chest including a governor for positioning said valves in response to turbine load and means for opening at least one of said valves when said governor is at rest; and

said means mounted externally of said valve chest coacting with each of said valve stems to vertically reciprocate and thereby open and close said valves in a sequential manner.

4,456,033

PERFORATED SHEET STOCK FLOW RESTRICTOR

George Kay, Anaheim, and Alan Keskinen, Van Nuys, both of Calif., assignors to Vacco Industries, South El Monte, Calif.

Filed Oct. 9, 1981, Ser. No. 310,098
Int. Cl.³ F15D 1/02
U.S. Cl. 138—42 13 Claims

7. A sound suppressing flow restrictor for conducting a pressurized fluid relatively noiselesly through a substantial pressure drop, comprising:

a housing having fluid inlet and outlet ports and a fluid passage communicating said ports;

an annular flow restrictor mounted in said passage for conducting a fluid generally radially therethrough from said inlet port to said outlet port;

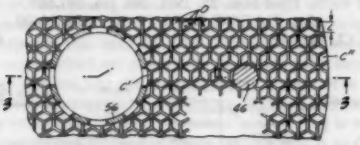
said restrictor having a plurality of randomly arranged inlets and a plurality of randomly arranged outlets; and,

means in said restrictor comprising a concentrically stacked plurality of flat sheets of a sheet material defining a myriad of generally radially extending and laterally intercommunicating, chambered, tortuous fluid passages through said flow restrictor, said tortuous fluid passages having dissimilarly spaced bars and dissimilarly shaped orifices defined by eccentrically overlapping perforations in said flat sheets of sheet material along different generally radial lines of flow such that each radial line of fluid passage is different from every other radial line of passage within a quadrant of said annular flow restrictor whereby said sheets adapted for being set in any one of a number of pre-determined eccentric relationships adapted for conducting non-compressible or compressible fluids between said randomly arranged inlets and said randomly arranged outlets.

13. A method of restricting the flow of and inducing a pressure drop in a high pressure fluid, comprising:

providing at least two planar sheets, each of said sheets having a pluraliiy of uniformly distributed perforations;

eccentrically stacking said sheets such that each perforation of one sheet overlies a plurality of perforations of the other sheet to define a plurality of orifices permitting fluid communication, each of said sheets includes randomly



arranged opensided ones of said perforations to define edgewise randomly arranged inlets and randomly arranged outlets in each of said sheets;

disposing said attacked sheets between a parallel pair of solid plates for thereby defining a flow restrictor having an inlet communicating with said randomly arranged inlets of said sheets and an outlet communicating with said randomly arranged outlets of said sheets;

flowing the fluid between said parallel pair of solid plates, between said inlet and said outlet;

setting said sheets in a pre-selected one of a number of predetermined eccentric relationships adapted for conducting non-compressible or compressible fluids between said randomly arranged inlet and said randomly arranged outlets; and,

between said inlet and said outlet, progressively dividing and recombining the fluid through said orifices along chambered flow paths while maintaining lateral fluid communication between the flow paths, repeatedly changing the orientation of said flow paths relative to a series of the orifices along said flow paths such that the progressive dividing and recombining of the fluid through orifices along each chambered flow path is different from that of any other chambered flow path with respect to the pattern of changes in orientation of the flow path relative to the series of orifices therealong.

4,456,034

FORMABLE HOSE

Guy T. Bixby, 311 Francis St., Longmont, Colo. 80501

Continuation-in-part of Ser. No. 122,783, Feb. 19, 1980, Pat. No. 4,295,496. This application Dec. 29, 1980, Ser. No. 221,123

Int. Cl.³ F16L *55/00, 11/11*

U.S. Cl. 138—122 **27 Claims**

1. A hose adapted to be selectively deformed to a desired configuration, comprising:

an elongated flexible polymeric hose body having an internal passageway;

a helical coil spring insert reinforcement positioned within the passageway thereof and having portions positioned adjacent the hose body;

shaping member means positioned adjacent said portions of the spring means and selectively deformable to a desired shape-retaining configuration; and

means distinct from the shaping member means and spring means attaching the shaping member means to said portions of the spring means.

4,456,035

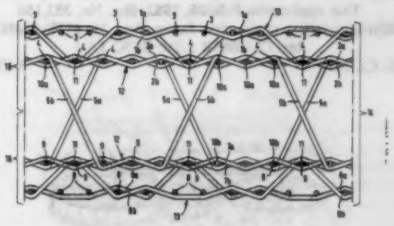
METHOD OF MAKING DOUBLE-SIDED TEXTILE MATERIAL AND TEXTILE MATERIAL PRODUCED THEREBY

Werner Brüggemann, Krefeld, and Heinrich Laus, Grefrath, both of Fed. Rep. of Germany, assignors to Girmes-Werke AG, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 355,397

Int. Cl.³ D03D *27/10, 39/18*

U.S. Cl. 139—398 **11 Claims**



1. A method for making double-sided textile having weft threads, warp threads and pile threads in a pattern, the textile being suitable for use in clothing, wherein a plush surface is provided on a first side and a second side has the appearance of a smooth flat weaving machine product, the method comprising weaving a textile fabric comprising first and second plies, each ply having a first pile-carrying layer connecting together the two plies by pile yarns tied into the pile-carrying layers only, and secondly an outer woven layer tied into a respective pile-carrying layer, the outer woven layer and the respective pile-carrying layer together having no more than 4 warp threads in the pattern and an average of less than one binding

at every weft thread in the pattern, and cutting the connecting pile yarns to form said double-sided textile.

4,456,036

WIRE BENDING APPARATUS AND A METHOD OF BENDING A WIRE

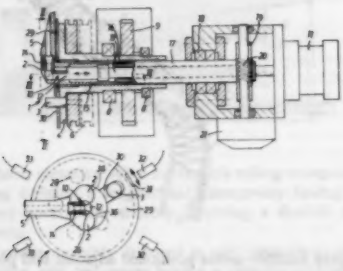
Piergiorgio Rossi, Claro, Switzerland, assignor to Oemb SA, Bodio, Switzerland

Filed Nov. 18, 1982, Ser. No. 442,742

Claims priority, application Switzerland, Nov. 18, 1981, 7413/81

Int. Cl.³ B21F 1/00

U.S. Cl. 140—105 8 Claims



1. An improved wire-bending apparatus including a central mandrel which is intended to control the axis of the bends and the radius of curvature of the bent wire, including further a shearing means located within said central mandrel and a retractable and extendable bending mandrel movable by means of a bending table along a circular curve extending around said central mandrel,

wherein said central mandrel and said shearing means form together an exchangeable unit such to cope with various wire cross sections and various radii of curvature.

4,456,037

PROCESS OF DELIVERING SAMPLES AND REAGENTS

Nagahiro Gocho, Hachioji, Japan, assignor to Olympus Optical Company Limited, Japan

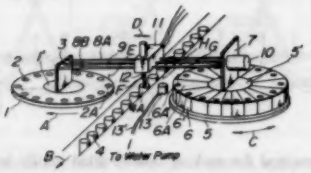
Continuation of Ser. No. 139,757, Apr. 14, 1980, abandoned.

This application Feb. 25, 1982, Ser. No. 352,156

Claims priority, application Japan, Apr. 19, 1979, 54-48199

Int. Cl.³ B65B 3/04; B67C 3/02

U.S. Cl. 141—1 8 Claims



1. A process of delivering each of successive samples and at least one reagent selected from a plurality of reagents into each of successive reaction vessels by means of a common delivery device comprising:

a step of aspirating a given amount of a sample into a probe of the delivery device;

a step of discharging the aspirated sample into a reaction vessel;

a step of aspirating a given amount of a given desired reagent selected from the plurality of reagents into the probe of the delivery device;

a step of discharging the aspirated reagent into the reaction vessel; and

a step of washing inner and outer walls of the probe or a liquid path connected to the probe of the delivery device with wash-liquid or diluent, the washing of the outer wall of said probe being effected by moving the probe in the wash-liquid or diluent, and this washing step being interposed between the sample or reagent aspirating step and the sample of reagent discharging step.

4,456,038

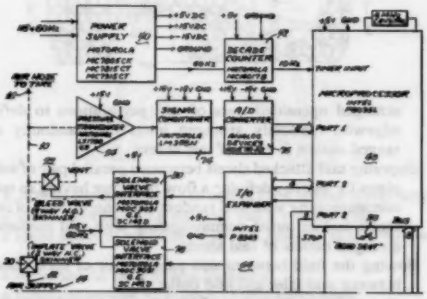
APPARATUS FOR PRESSURIZING TIRES TO A DESIRED LEVEL

Robert E. Gwaltney, Brentwood, and Jim L. Holladay, Nashville, both of Tenn., assignors to Hennessy Industries, Inc., La Vergne, Tenn.

Filed Mar. 25, 1981, Ser. No. 247,609

Int. Cl.³ B60C 23/00, 29/00; B65B 31/00

U.S. Cl. 141—95 6 Claims



1. Apparatus for rapidly achieving a desired pressure level in a tire by gas flow through a port in the tire such as a valve stem comprising:

a conduit having one end for connection to a source of gas under pressure and another end for connection to the inflation port of a tire, the path between said conduit and the inflation port being susceptable to leakage;

a valve means for selectively (a) closing and opening said conduit and (b) for venting said conduit to the atmosphere;

means for selecting a desired pressure level less than the pressure level of said source;

pressure level sensing means connected to said conduit; and

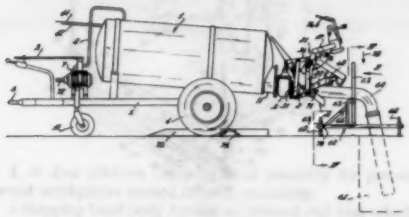
control means responsive to said sensing means and to said selecting means for digitally operating said valve means to apply gas under pressure substantially at the pressure level of said source to the tire port throughout an inflation cycle, for relieving pressure in the tire at a level in excess of said desired pressure level and for closing said conduit when said desired pressure level is attained, said control means further including means for detecting leakage in said path after said desired pressure level is attained and in response thereto, digitally operating said valve means to maintain the pressure level at said desired pressure level notwithstanding such leakage.

4,456,039

DEVICE FOR TRANSPORTING AND/OR SPREADING LIQUIDS

Ary van der Lely, Maasland, and Cornelis J. G. Bom, Rozenburg, both of Netherlands, assignors to C. Van der Lely N.V., Maasland, Netherlands

Filed Dec. 22, 1981, Ser. No. 333,334
Claims priority, application Netherlands, Dec. 23, 1980, 8007000; Mar. 9, 1981, 8101110; Jul. 15, 1981, 8103354
Int. Cl.³ B65B *3/04*; B05B *9/00*
U.S. Cl. 141—98 68 Claims



1. A device for transporting and/or spreading fluids comprising a hopper and a conduit therefrom with a valve in said conduit and an opening after said valve through which fluids can be passed into or out of said hopper, displaceable coupling means adjacent said opening, said coupling means including linkage means which are constructed and arranged selectively to engage or disengage either a fluid supply connector or fluid distributor means carried by said linkage means on or from said opening to open said valve only when said opening is so engaged and to close said valve before said opening is so disengaged, said valve being automatically operated to be opened by said coupling means responsive to said linkage means positioning said fluid supply connector or said fluid distributor means on said opening, said supply connector and said distributor means being automatically disengaged by said linkage means responsive to said coupling means closing said valve.

4,456,040

TAP DEVICE FOR CONTAINER TREATMENT INSTALLATION PARTICULARLY FOR CARBONATED BEVERAGE BOTTLES

Marcel Bacroix, Audincourt; Joseph Menini, Seloncourt, and Serge Lagoutte, Buxy, all of France, assignors to Pont-A-Mousson S.A., Nancy, France

Filed Jan. 14, 1981, Ser. No. 225,153
Claims priority, application France, Jan. 17, 1980, 80 00957
Int. Cl.³ B65B *43/50*, *43/60*, *37/02*
U.S. Cl. 141—150 5 Claims

1. A tapping apparatus for filling bottles (5), particularly with carbonated liquids, comprising:

(a) a movable support (12),

(b) a liquid reservoir (19) movable with the support,

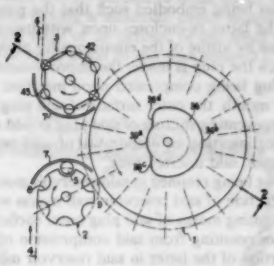
(c) at least one spigot (22) mounted on and fed by the reservoir, said spigot having an outwardly angled nozzle (30),

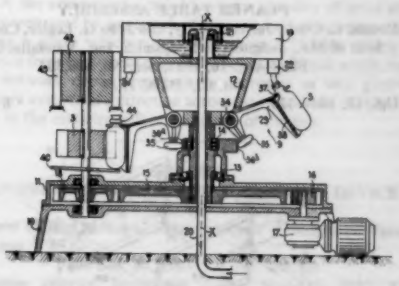
(d) an input device (2) disposed tangential to the support for transporting a vertically oriented bottle to the support proximate the spigot, said bottle having a body portion and an enlarged diameter collar (44) on a neck portion thereof proximate a fill opening,

(e) an output device (3) disposed tangential to the support for removing filled bottles therefrom,

(f) an articulated mechanism (23) pivotally mounted to the support and comprising a fork portion (37) for engaging the bottle at the neck portion thereof below the collar to suspend the bottle, and a connected wall portion (38) for laterally supporting the body portion of the bottle, and

(g) fixed cam means for engaging and pivoting the articulated mechanism during movement of the spigot between





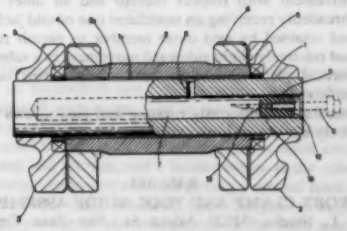
the input and output devices to temporarily angularly incline the bottle for filling engagement with the nozzle.

4,456,041

APPARATUS FOR FILLING AND SEALING A LUBRICANT RESERVOIR

Walter Grilli, Modena; Aldo Crotti, Castelvuovo Rangone, and Orlando Berselli, Vignola, all of Italy, assignors to Italtractor I.T.M. S.p.A., Castelvetro, Italy

Filed May 11, 1981, Ser. No. 262,507
Claims priority, application Italy, Jun. 26, 1980, 40053 A/80
Int. Cl.³ B65B *7/28*
U.S. Cl. 141—329 11 Claims



1. Apparatus for filling and sealing a lubricant reservoir having interior wall means and located within the pivot element of lubricated turning pairs, in particular track link pivots and crawler track rollers, of the type including

a plug fashioned from elastomeric material and insertable into the mouth of the lubricant reservoir to seal said reservoir,

needle means for injecting lubricant into the reservoir insertable through the plug in such a way that its extremity

gains access to the reservoir interior, said needle means being withdrawn from the plug following introduction of the lubricant into the reservoir, the plug and the needle means being embodied such that the puncture produced by the latter re-encloses upon withdrawal of the needle means by virtue of the elastic quality of the material from which the plug is made, the improvement comprising:

said plug being compressed upon insertion into said reservoir mouth, the outer surface of said plug defining means for preventing shifting of said plug in said reservoir mouth during insertion, or withdrawal of, said needle means into, or from, said inserted plug,

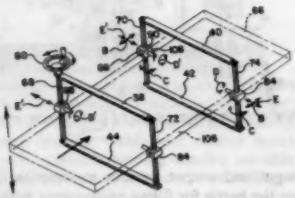
said plug being retained in said reservoir mouth solely by the interaction of said reservoir wall means with said shifting preventing means of said plug outer surface and the radial forces resulting from said compression of said plug after insertion of the latter in said reservoir mouth.

4,456,042

PLANER TABLE ASSEMBLY

Donald L. Clark, Jefferson City, and John G. Legler, Columbia, both of Mo., assignors to Shopsmith, Inc., Vandalia, Ohio

Filed Aug. 16, 1982, Ser. No. 408,534
Int. Cl.³ B27C *1/14*
U.S. Cl. 144—129 **8 Claims**



1. In a planer of the type having a housing which includes an interior chamber and a motor driven blade member rotatably mounted to said housing and extending transversely of said interior chamber, an improved table assembly comprising:

a plurality of jack screws rotatably mounted to said housing and positioned substantially vertically within said interior chamber;

a table positioned adjacent said jack screws beneath said blade member and having a substantially flat and horizontal surface;

a plurality of connector nuts, each connector nut including an outer member to said table for rotational and sideward movement with respect thereto and an inner member threadedly receiving an associated one of said jack screws and retained by said outer member to permit rotational and relatively slight sideward movement in a substantially vertical plane extending transversely across said table surface; and

means for synchronously rotating said jack screws to selectively elevate or lower said table.

4,456,043

WORK CLAMP AND TOOL GUIDE ASSEMBLY

David L. Stocks, 32221 Alipaz St., San Juan Capistrano, Calif. 92675

Continuation of Ser. No. 276,041, Jun. 22, 1981, abandoned. This application Oct. 24, 1983, Ser. No. 544,823
Int. Cl.³ B23Q *3/00*
U.S. Cl. 144—136 C **5 Claims**

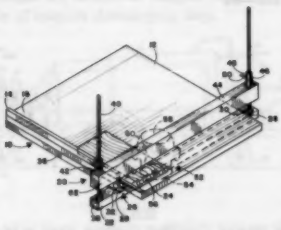
1. A work clamp and tool guide assembly with a base plate which comprises:

(a) a base plate;

(b) a crossbar having distal vise means to secure said crossbar to the undersurface of said base plate at the forward edge of said base plate;

(c) first and second upright posts, one each located and fixedly secured at an opposite end of said crossbar;

(d) a guide rail having a substantially greater depth than width, a smooth, unbroken vertical guide surface, and a smooth, unbroken clamping undersurface, and coextensive with said crossbar with distal, transverse through bores slideably received over said first and second upright posts;



(e) guide rail locking means operatively engaging each of said posts to fixedly secure said guide rail at adjustable positions thereon, and

(f) a fence fixedly secured to said base plate and extending along one edge of said work piece orthogonal to and rearward of said clamp and tool guide assembly.

4,456,044

STARTER WEDGE FOR SPLITTING WOOD

Michael E. Clones, 402 W. 6th, Alexandria, Ind. 46001

Filed Feb. 2, 1982, Ser. No. 345,070
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—193 D **8 Claims**

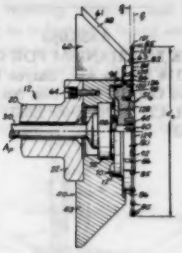
1. A starter wedge for splitting wood comprising an elongated metallic body having two opposed wedging surfaces which converge from a head end toward a penetrating end, said body also having two spaced longitudinally extending lateral sides extending between said ends, said penetrating end being in the form of a chisel edge with at least one portion thereof being pointed, said chisel edge extending (from said pointed portion to) between said sides and being sharpened to a knife edge which merges with at least one of said wedging surfaces, said chisel edge receding from the pointed portion of the penetrating end so that initial contact of the chisel edge with a piece of wood being split occurs progressively along the chisel edge as the wedge precedes into the wood.

4,456,045

DUAL ROTATION CHIPPING HEAD

James L. Gregoire, 85 Willowick Dr., Decatur, Ga. 30038

Filed Jan. 13, 1983, Ser. No. 457,866
Int. Cl.³ B27C 9/00
U.S. Cl. 144—373 20 Claims



1. A dual rotation chipping head assembly for processing wood workpieces moved thereby including:

a chipping head body having an inboard end past which the workpiece is moved;

a tubular chipping arbor member mounting said chipping head body thereon for rotation therewith about a primary axis of rotation;

a facing head body;

a facing arbor member rotatably mounted in said chipping arbor member coaxially therewith, said facing arbor member mounting said facing head body thereon adjacent the inboard end of said chipping head body for rotation independently of said chipping head body and said chipping arbor member;

a plurality of chipping knife means circumferentially spaced around the periphery of and mounted on said chipping head body for rotation therewith, said knife means defining chipping edges thereon adapted to chip that portion of the wood workpiece moved thereby which lies outboard of an end cutting plane at the inboard end of said chipping head body; and

a plurality of cutter means circumferentially spaced around said facing head body for rotation therewith independent of said chipping knife means, said cutter means defining cutting edges thereon just inboard of the end cutting plane of said chipping knife means to form a flat face on the wood workpiece along a facing plane lying inboard of the end cutting plane.

17. A method of chipping wood workpieces comprising the steps of:

moving the wood workpieces along a prescribed feed path;

locating a chipping head with chipping knives thereon adjacent the feed path so as to chip away those portions of the wood lying outboard of a prescribed chipping plane;

locating a facing head with facing cutters thereon coaxially with the chipping head so as to form a face on the wood workpiece lying just inboard of the prescribed chipping plane;

rotating the chipping head at a first prescribed speed to generate prescribed size wood chips; and

rotating the facing head at a second prescribed speed to generate a prescribed surface finish on the face of the wood workpiece.

4,456,046

HIGH-SPEED TIRES

Timothy I. Miller, 3848 Greenfield Rd., Uniontown, Ohio 44685

Filed May 11, 1981, Ser. No. 262,238
Int. Cl.³ B60C 11/00
U.S. Cl. 152—209 R 33 Claims

1. A tire comprising a tread having a plurality of tread elements separated by a network of grooves, said groove network having a maximum depth within a distance from both sides of the mid-circumferential plane of the tire of 10 percent of the tread width, said maximum depth being equal to at least the lesser of 0.20 inch and 2.5 percent of tread width, said groove network further having a minimum depth within a distance from each tread edge of 20 percent of the tread width, said minimum depth being equal to less than about 0.15 inch.

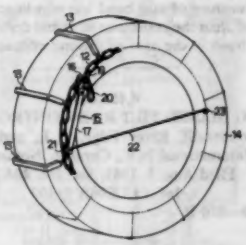
2. A tire comprising a tread having a plurality of tread elements separated by a network of grooves, said groove network having a depth which is less than about 0.15 inch within a distance from each tread edge of 20 percent of tread width, and said network depth progressively increases as said groove network extends in a direction across the tread from each tread edge to the mid-circumferential plane of the tire.

4,456,047

CONNECTING STRUCTURE OF TRACTION DEVICE FOR VEHICLE WHEELS

Kenichi Ishida, Ishikawa, Japan, assignor to Shigetoyo Yasui, Japan

Filed Sep. 30, 1982, Ser. No. 430,521
Claims priority, application Japan, May 11, 1982, 57-68583[U]
Int. Cl.³ B60C 27/06
U.S. Cl. 152—213 A 2 Claims



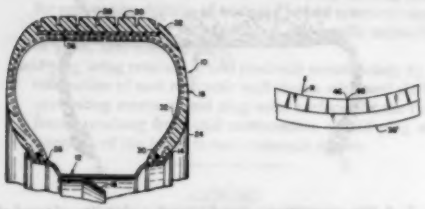
1. A connecting structure for a traction device for mounting around an automotive tire having traction means secured between spaced wire means, said connecting structure comprising a first extension member having a first hook means at one end adapted to engage the wire means on the outer side of the tire at one end portion, and a holder means at the other end, and a second extension member having a second hook means corresponding to said first hook means adapted to engage the other end portion of said wire means on the outer side of the tire, said second extension member being shorter than said first extension member and being pivotably rotatable on said first extension member, whereby upon fastening said connecting structure to a traction device, said second extension member is rotated in a direction so that both first and second hook means approach each other with said hook means being hooked to the ends of the wire means and overlap when holding the wire means in the rotated position, and an elongated resilient member mounted on the end of said connecting structure near said holder means, said resilient member having a hook means at its end for engaging the wire means on the outer side of the tire.

4,456,048

DUAL-MODULUS BAND BANDED TIRE

Edward G. Markow, Oakdale, and Michael A. Kopsco, Wantagh, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Jan. 24, 1983, Ser. No. 460,492
Int. Cl.³ B60C 17/00
U.S. Cl. 152—330 RF 18 Claims



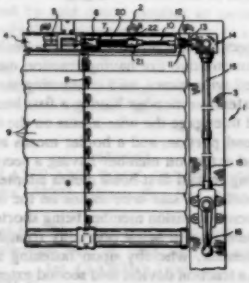
1. In a banded radial run-flat tire having a resilient annular band in the crown region of said tire, said band being reinforced and stabilized by a multiplicity of radial elements in the tire sidewalls so that said band acts as a compression element to support said tire in the run-flat condition, an improved dual modulus of bending band having a low bending modulus at low stress levels of the band due to low radial deflection associated with operation at normal tire inflation pressures and a distinctly higher modulus at higher stress levels associated with increased radial deflection due to decreases in tire inflation pressures, wherein said resilient annular band includes at least an annular region thereof containing means for resisting compression loads such that resistance to radial deflection tending to decrease the local radius of curvature of said band is greater than the resistance to radial deflection tending to flatten said band, whereby said, resilient annular band exhibits increased bending stiffness circumferentially with increases in deflection such that resistance to radial deflection tending to decrease the local radius of curvature of said band has non-linear characteristics and is greater than the resistance to radial deflection tending to flatten said band in the area of ground contact of the tire.

4,456,049

SPRING BIASED TILT ROD CONTROL SYSTEM

Francis Vecchiarelli, River Edge, N.J., assignor to Hunter Douglas International N.V., Curacao, Netherlands Antilles

Filed Aug. 2, 1982, Ser. No. 404,282
Int. Cl.³ E06B 9/307
U.S. Cl. 160—176 R 6 Claims



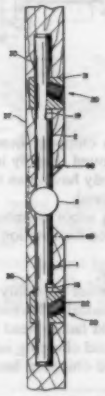
1. A spring biased venetian blind tilt rod control system comprising a rotatable tilt rod, mounting means for mounting said tilt rod for rotational movement, tilt rod drive means for rotating said tilt rod, spring activated connection means adapted to operatively connect said drive means with said tilt rod and being displaceable with respect to said mounting means in a direction lengthwise of the tilt rod axis, spring means for urging said spring activated connection means to operatively connect said drive means and said tilt rod, wherein said spring means are operatively positioned between said mounting means and said connection means, and stop means for limiting the displacement of said connection means under the effect of said spring means.

4,456,050

HINGE LOCK MECHANISM FOR DISPLAY UNITS

Robert Rivers, 1114 Linden Ave., Sharon Hill, Pa. 19079

Filed Oct. 15, 1979, Ser. No. 84,720
Int. Cl.³ A47G 5/00; E05D 11/10
U.S. Cl. 160—233 14 Claims



1. A hinge lock mechanism for joining two or more panels together at any angle comprising a top arm with a slanted, flat surface thereon that is integrally connected to a housing with a passageway therein, having left hand threads thereon, a bottom arm with a slanted, flat surface thereon that is integrally connected to a housing at one end with a passageway therein having a flat surface, a center shaft that passes through the passageways of the top and bottom housing, said center shaft having left hand threads on one portion thereof for communicating with the threads in the top housing and a smooth portion with a flat surface for communicating with the bottom housing and at each end having a right hand threaded portion, locking means with right hand threads therein that fit on each end of the center shaft for urging the top and bottom housing together in a locking relationship, and clamping means for securing the arms with the panels.

10. A multiple panel displaying unit comprising a plurality of panels hingedly joined together with a plurality of detachable hinge lock mechanisms of claim 1.

4,456,051

SCROLL MANUFACTURING METHOD

Seiichi Hukuhara, Takasaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed Mar. 2, 1982, Ser. No. 353,830
Claims priority, application Japan, Mar. 2, 1981, 56-28312
Int. Cl.³ B22D 25/02
U.S. Cl. 164—131 7 Claims

5. A method for manufacturing a scroll for use in a scroll type fluid displacement apparatus, comprising the steps of:

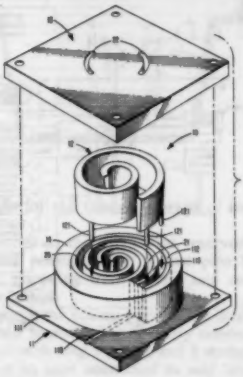
(a) providing a molding member having an end plate and two involute wall elements extending from one side surface thereof to define two involute grooves, a first of said grooves having a wedge-shaped axial configuration with the narrow portion of said wedge shape being adjacent said end plate and the broad portion of said wedge shape being adjacent an open end of said two grooves, and a

second of said grooves having a generally rectangular-shaped axial cross-sectional configuration;

(b) inserting a mating wedge-shaped insertion member into said first involute groove to fill the space within said first groove;

(c) covering the open end of said first and second grooves with a second molding member, said second molding member having an indentation facing and in communication with said open end of said grooves to define a space within which an end plate of the scroll is formed;

(d) filling the space of said second involute groove and said indentation with molten metal to form the molten metal into the shape of the spiral element of the scroll with a



substantially rectangular axial cross-section within said space of said second involute groove and into the shape of the end plate of the scroll within the space of said indentation;

(e) allowing the molten metal in said indentation and said second involute groove to solidify while preventing the expansion of said second involute groove by the placement of said wedge-shaped insertion member in said first wedge-shaped involute groove; and

(f) removing said insertion member from said first groove and removing said scroll formed in said second groove and said indentation from said first molding member by relative axial movement of said insertion member and said formed scroll with respect to said involute wall elements.

4,456,052

APPARATUS FOR OSCILLATING A CONTINUOUS CASTING MOLD

Takashi Kawakami, Niihama, Japan, assignor to Concast Holding AG, Zurich, Switzerland

Continuation-in-part of Ser. No. 214,527, Dec. 8, 1980, abandoned. This application May 2, 1983, Ser. No. 490,780
Claims priority, application Japan, Dec. 19, 1979, 54-175885
Int. Cl.³ B22D *11/04*
U.S. Cl. 164—416 **1 Claim**

1. An apparatus for oscillating a continuous casting mold for the continuous casting of a strand, comprising:

a fixedly arranged bearing block;

a mold table at which there is mounted the continuous casting mold;

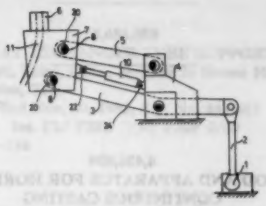
two short oscillation levers for supporting and guiding said mold table during oscillatory movement thereof;

each of said short oscillation levers having opposed ends;

shaft means for hingedly connecting respective ones of said opposed ends of said oscillation levers neighboring said mold table with said mold table;

shaft means for pivotably mounting the opposite opposed ends of said oscillation levers with said fixedly arranged bearing block;

an oscillation drive for moving one of said short oscillation levers about bearing locations thereof in said fixedly arranged bearing block; and



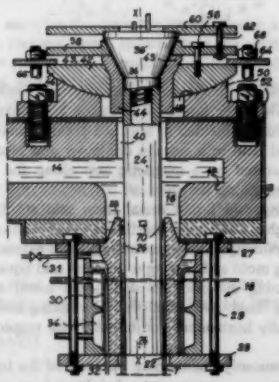
a power-applying device operatively connected with said fixedly arranged bearing block and said mold table for producing a force which extends approximately parallel to said oscillation levers for continuously pressing the shaft means thereof in a defined direction at the bearing locations during the oscillatory movement and to thus compensate for any existing bearing play.

4,456,053

APPARATUS FOR SUPPORTING AND CENTERING A DIE CORE IN CONTINUOUS TUBE CASTING

Yves Gourmel, Pont A Mousson, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Jun. 30, 1982, Ser. No. 393,945
Claims priority, application France, Jul. 6, 1981, 81 13239
Int. Cl.³ B22D *11/00, 11/04*
U.S. Cl. 164—421 **10 Claims**



1. An apparatus for supporting and centering a cylindrical core (24) inside an annular die (18) of a vertical continuous casting installation for thin tubes, comprising: a casting head (12) connecting a casting vessel (2) to a narrow annular space (26) of an annular die, a clampable ball-and-socket joint (42, 44, 46, 48, 50) disposed between an upper end (38) of an elongated, vertically depending core and an upper part of the casting head for supporting the core, means for clamping the ball-and-socket joint, the core traversing the casting head with a substantial degree of clearance, and the ball-and-socket joint enabling, when unclamped, lateral movement of said core upper end, and a series of identical, relatively small projections (70, 72, 74) regularly spaced around the periphery of the core substantially below the upper end thereof and in limited area contact with an internal wall of a mold (22) at the upper open-

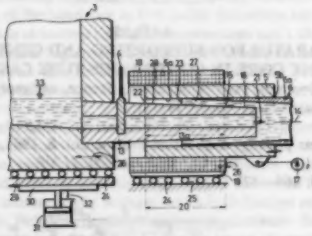
ing of the annular die at a level of immersion in the liquid metal during casting, whereby the core may be rocked about the projections in contact with the mold wall, with the ball-and-socket joint unclamped, to center the core in the mold inside the annular space of the die, whereafter the joint may be clamped to maintain such centering.

4,456,054

METHOD AND APPARATUS FOR HORIZONTAL CONTINUOUS CASTING

Siegfried Henders, Geldern, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Mar. 11, 1981, Ser. No. 242,609
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1980, 3009189
Int. Cl.³ B22D *11/16, 11/00*
U.S. Cl. 164—454 18 Claims



1. A method for horizontal continuous casting of liquid metal, in which the liquid metal in the horizontal continuous casting mold is subjected to both the gravitational force of the liquid metal held in a storage container and electromagnetic forces generated by a magnetic coil along the direction of casting, comprising the steps of:

(a) passing said liquid metal from said storage container through a drain pipe and directly into said casting mold, said drain pipe having a discharge end extending into said casting mold and serving to prevent said liquid metal from contacting air prior to said liquid metal entering said casting mold, said drain pipe and casting mold being substantially horizontally adjustable with respect to one another,

(b) continuously maintaining the level of the liquid metal in said storage container at a height at least as high as the uppermost inside wall surface of said horizontal continuous casting mold,

(c) continuously regulating the location of said electromagnetic coil along the direction of casting so that said electromagnetic coil overlays both at least the upstream end of said horizontal continuous casting mold and the trailing end of said liquid metal in said casting mold,

(d) continuously drawing the cooling cast metal strand from said casting mold,

(e) maintaining, by adjusting said electromagnetic coil and said level of liquid metal, the location of said trailing end of said liquid metal so that said trailing end is located within said casting mold and said magnetic coil, and

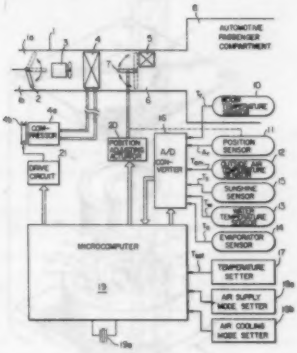
(f) maintaining said trailing end of said liquid metal open to the atmosphere.

4,456,055

AUTOMOTIVE AIR CONDITIONER HAVING COATING POWER CONTROL DEVICE

Akiro Yoshimi, Kariya; Michihiko Kamiya, Handa; Yasuhumi Kojima; Fumio Ootsuka, both of Gifu, and Takeo Matsushima, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Feb. 8, 1982, Ser. No. 347,025
Claims priority, application Japan, Feb. 12, 1981, 56-19762
Int. Cl.³ F28F *13/00*
U.S. Cl. 165—12 9 Claims



1. An automotive air conditioner for regulating the air temperature within an automotive passenger compartment comprising:

(a) air duct means for supplying air to said automotive passenger compartment;

(b) blower means for producing an air stream in said air duct means;

(c) air temperature changing means including:

cooling means disposed in said air duct means for lowering the temperature of said air stream;

heating means disposed in said air duct means for raising the temperature of said air stream; and

temperature adjusting means for controlling the effects of said cooling and heating means;

(d) sensor means including:

room temperature sensor means for generating a signal indicating the temperature of air within said automotive passenger compartment;

outside air temperature sensor means for generating a signal indicating the ambient air temperature outside said passenger compartment;

cooling power sensor means for generating a signal indicating the cooling power of said cooling means; and

heating power sensor means for generating a signal indicating the heating power of said heating means;

(e) temperature setter means for manually selecting a desired temperature of said passenger compartment; and

(f) electronic control means for:

computing a required temperature of said air stream from said signals generated by said room temperature sensor means, said outside air temperature sensor means, and said desired passenger compartment temperature of said temperature setting means, and generating a first control signal to control said temperature adjusting means according to said computed required temperature and signals generated by said cooling power sensor means and said heating power sensor means, and

comparing said computed required temperature with said

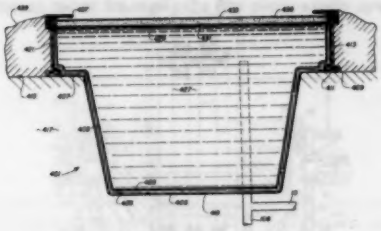
signal from said outside air temperature sensor means and generating a second control signal for determining the cooling power of said cooling means.

4,456,056

MODIFIED ANNUAL CYCLE ENERGY SYSTEM

Terrence J. Sills, 207 S. Castle Dr., Dunlap, Ill. 61525

Filed Sep. 16, 1982, Ser. No. 418,811
Int. Cl.³ F28D 21/00
U.S. Cl. 165—45 10 Claims



1. An apparatus for the thermal storage of ice and water comprising:

a reservoir formed in the earth, said reservoir having an insulated, leak resistant liner; a heat pipe having fluid therein and extending from within said reservoir into adjacent earth; and

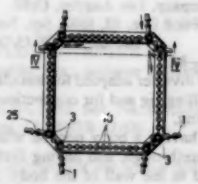
means for adjusting the boiling point of the fluid within said heat pipe, said means being operably connected to said heat pipe and including a pump, and a storage tank, said pump having an inlet connected to said heat pipe, said inlet connected to a first check valve, said pump having an outlet connected to said storage tank, said outlet connected to a second check valve, said inlet and said outlet having a shutoff valve operably connected therebetween.

4,456,057

SOOT BLOWER

Henryk Melcer, Seuzach, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Sep. 15, 1981, Ser. No. 302,665
Claims priority, application Switzerland, Sep. 19, 1980, 7053/80
Int. Cl.³ F28G 5/00
U.S. Cl. 165—95 3 Claims



1. A heat exchanger comprising

a plurality of heat exchange walls defining a prism shape, each said wall including a plurality of parallel tubes and ribs welded between said tubes;

a double tube disposed in each said wall in a plane of said tubes of said respective wall and near an edge at an adjacent wall, said double tube including an inner tube for conveying a soot-blowing medium and an outer tube about said inner tube to define an annular gap therebetween disposed on an axis parallel to the remaining tubes of said wall;

a plurality of nozzles in each double tube, each said nozzle being connected to said inner tube and said outer tube of a respective double tube for conducting the soot-blowing medium from said respective inner tube out of said respective outer tube across an adjacent wall; and

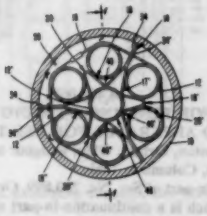
a distributor connected to said parallel tubes and said outer tube of a respective double tube in each wall.

4,456,058

HEAT EXCHANGER TUBE SUPPORT

John R. Powell, Tulsa, Okla., assignor to Brown Fintube Company, Houston, Tex.

Filed Nov. 30, 1982, Ser. No. 445,667
Int. Cl.³ F28D 7/10; F28F 9/00
U.S. Cl. 165—154 14 Claims



1. A heat exchanger tube support for supporting a plurality of heat exchanger tubes within a conduit of a heat exchanger, comprising:

three elements, each being a strip of material defining a radially extending projection at a mid-section thereof, two leg sections extending from the projection, and a channel being defined between each leg section and the projection; and

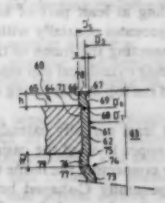
means for securing the elements together with a leg section of each element being secured to a leg section of each adjacent element, with each leg section extending radially outward, and with the channels of each element opening radially outward, the three elements enclosing an interior area within the heat exchanger tube support.

4,456,059

HEAT EXCHANGER HAVING A BUNDLE OF PARALLEL TUBES, AND METHOD OF ASSEMBLING ITS COMPONENT PARTS

Patrick Cadars, Montigny, France, assignor to Valeo, Paris, France

Filed Sep. 7, 1982, Ser. No. 415,029
Claims priority, application France, Sep. 14, 1981, 81 17353
Int. Cl.³ F28F 9/04
U.S. Cl. 165—173 10 Claims



1. A heat exchanger comprising:

a collector plate having a plurality of through-perforations, the walls of the through-perforations comprising a highly elastic material; and,

a plurality of thin metal tubes, one end of said tubes passing entirely through and beyond said plate via the perfora-

tions with said elastic material gripping and sealing the tubes within the through-perforations, wherein

the elastic material of the walls of the perforations causes a decrease in the inner and outer diameters of the tube portion elastically gripped, the portion of decreased diameters being flanked on either side by a portion having non-decreased diameters which holds the tubes fast against longitudinal movement in either direction relative to the collector plate.

4,456,060

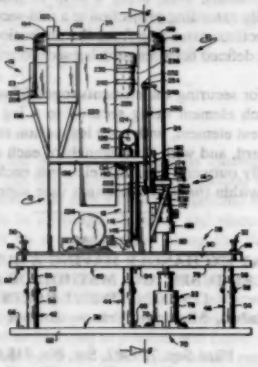
METHOD FOR PUMPING A LIQUID FROM A WELL AND APPARATUS FOR USE THEREIN

George E. Stanton, Orient, Ohio, assignor to Nujack Oil Pump Corporation, Columbus, Ohio

Continuation-in-part of Ser. No. 200,899, Oct. 27, 1980, Pat. No. 4,406,597, which is a continuation-in-part of Ser. No. 156,780, Jun. 5, 1980, Pat. No. 4,346,620. This application Aug. 11, 1982, Ser. No. 407,265

Int. Cl.³ E21B *43/00*

U.S. Cl. 166—68.5 **7 Claims**



1. In combination, hydraulic lifting means for raising a sucker rod in a casing, a frame supporting said lifting means, means for leveling at least part of said frame whereby said sucker rod reciprocates coaxially with said casing, and means for directly connecting the frame to the casing,

said casing being cylindrical and extending into a well in the ground and the top of said casing extending above ground level,

said frame at least partially extending above and partially below the upper level of the casing,

the means for connecting the frame to the casing comprising a pair of generally C-shaped brackets which generally conform to the shape of the cylindrical exterior of the casing, said brackets being connected to said frame and including means to grip the cylindrical exterior of the casing at a point below said top,

said leveling means including a plurality of telescopic non-rotating members connecting the frame and the casing for relative adjustment.

4,456,061

FILTERS USED IN WELL FLUID CLEANING OPERATIONS

Edward R. Swift, Jr., Houston, and John B. Echols, Friendswood, both of Tex., assignors to Baker International Corporation, Orange, Calif.

Filed Aug. 31, 1981, Ser. No. 298,036

Int. Cl.³ B01D *27/08, 29/10;* E21B *37/00*

U.S. Cl. 166—75 R **4 Claims**

1. An apparatus for filtering well fluids a barrier separating two fluid chambers; a plurality of hollow cartridges supports mounted in said barrier, each support providing a fluid passage therethrough and projecting into one of said chambers; an annular filter cartridge providing a secondary filter means and detachably secured to the projecting portion of each said cartridge support; and an uncoated fabric bag primary filter means surrounding each secondary filter cartridge and having its open end detachably secured to said secondary filter cartridge adjacent said cartridge support, whereby said primary filter bag may be removed with said secondary filter cartridge for cleaning the filter bag individually; and means for supplying particulate containing fluid from said well to said one chamber and means for removing filtered fluid from said other chamber.

4,456,062

FLOW DIVERTER

Joseph R. Roche, Humble; Gabriel G. Alexander, Houston, and Larry J. Tippit, The Woodlands, all of Tex., assignors to Hydril Company, Los Angeles, Calif.

Filed Dec. 13, 1982, Ser. No. 449,467

Int. Cl.³ E21B *33/06*

U.S. Cl. 166—84 **23 Claims**

19. A flow diverter adapted for installation below the rotary table of a drilling rig and for connection above a drilling conduit comprising,

a housing having a body portion with a generally vertical bore therethrough, and having first and second passages provided in the wall of the body, the body adapted for connection above the drilling conduit,

an annular packing element disposed within the housing,

first and second annular pistons concentrically disposed within the housing,

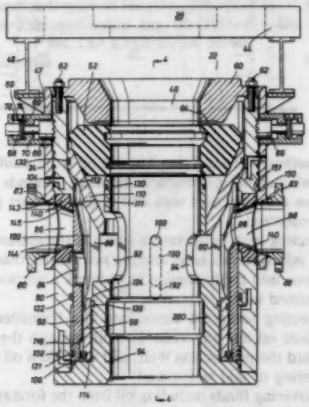
the first annular piston adapted for axial movement between first and second positions and having first and second holes provided in its wall,

whereby at the first position the first hole of the first piston is below the first outlet passage of the body wall and an upper part of the piston is above the first hole and the first outlet passage of the body wall, and the second hole of the first piston is in substantial alignment with the first outlet passage provided in the body wall, and the second hole of

the first piston is above the second outlet passage of the body wall and the lower part of the piston below the second hole covers the second outlet passage of the body wall,

the second annular piston adapted for engagement with the annular packing element and axial movement between third and fourth positions whereby the second piston urges the annular packing element radially toward annular sealing with a pipe or other object in the bore of the housing as the second annular piston moves from the third position to the fourth position,

actuating means for urging the first piston axially upward



from the first position to the second position and the second piston is urged axially upward from the third position to a fourth position sufficient to force the annular packing element to seal with a pipe or other object in the bore of the housing or to close the vertical flow path of the bore of the housing where the first annular piston is urged from the first position to the second position thereby covering the second outlet passage of the body wall with the lower part of the first piston below the second hole before the second piston is urged axially upward sufficiently to cause the annular packing element to seal with a pipe or other object in the bore of the housing.

4,456,063

FLOW DIVERTER

Joseph R. Roche, Humble, Tex., assignor to Hydril Company, Los Angeles, Calif.

Filed Dec. 13, 1982, Ser. No. 449,531

Int. Cl.³ E21B *33/06*

U.S. Cl. 166—84 **17 Claims**

16. A flow diverter adapted for use with a drilling rig comprising,

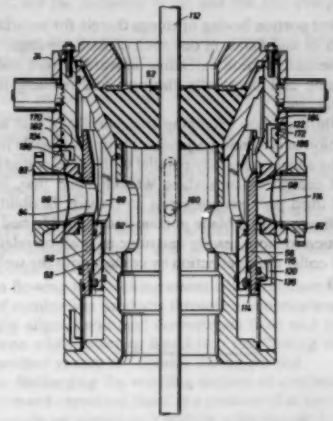
a housing having a bore therethrough and at least one outlet passage provided in its wall,

a packing element disposed within the housing,

an annular piston disposed within the housing beneath the packing element and adapted for moving from a lower position to an upper position within the housing,

the wall of said annular piston in said lower position covering said outlet passage in the housing wall and preventing fluid communication from the bore of the housing to the outlet passage, and

in the upper position, the wall of the annular piston at least partially uncovering said outlet passage and allowing fluid communication from the bore of the housing to the outlet passage as the piston urges said packing element to close



about an object extending through the bore of the housing.

4,456,064

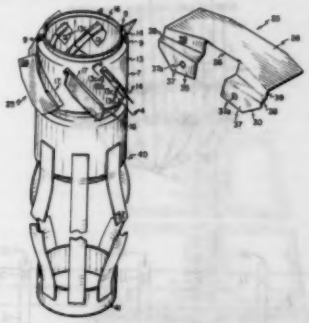
WELL BORE WALL CLEANER

Lamar Ford, P.O. Box 490, Marshall, Tex. 75670

Filed Mar. 3, 1983, Ser. No. 471,774

Int. Cl.³ F21B *37/00*

U.S. Cl. 166—123 **2 Claims**



1. An apparatus for positioning on a tubular member to be lowered into a well bore for cleaning the sides thereof comprising:

a. a pair of semicircular annular members;

b. means for hingedly securing said semicircular members together to form a collar for positioning on a tubular member;

c. said collar including a central, longitudinally and annularly extending surface with an inwardly extending portion at each end providing longitudinally and annularly extending rings at each end of said collar for abutting the tubular member and to space said central surface from the tubular member;

d. said central portion having a plurality of spaced openings disposed at an angle to the longitudinal axis of said collar;

e. a plurality of thin plates of metal, each of said plates including:

(1) a blade portion for projecting generally radially outwardly of said collar to contact the well bore wall;

(2) a pair of spaced legs formed by spaced strips extending from one edge of said blade portion in generally a plane transverse to said blade portion, each of said legs including:

(a) a first portion having openings therein for securing one each of said plates in one each of said openings;

(b) a second portion extending upwardly from said first portion and outwardly through said opening in said collar; and

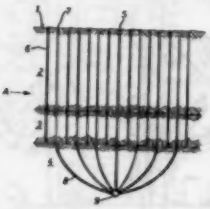
(c) a third portion extending transversely of said second portion and forming a juncture with said blade portion along a plane generally parallel with and elevated above said central collar surface whereby said first, second and third portions cooperate to provide flexibility and resiliency to said blade portion and to enable said blade portion to more readily reassume its position relative to said collar after deflection by contact with the well bore wall.

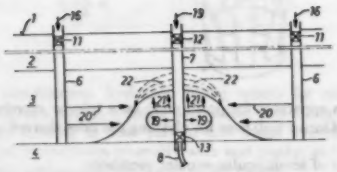
4,456,065

HEAVY OIL RECOVERING

Werner Heim, Zollikon; Fritz J. Wolf, Zollikerberg, both of Switzerland, and Winsor T. Savery, The Woodlands, Tex., assignors to Elektra Energie A.G., Zollikon, Switzerland

Filed Aug. 20, 1981, Ser. No. 294,629
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—248 **20 Claims**





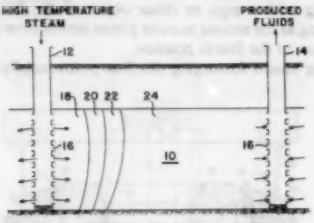
18. Method of recovering underground oil in a selected region comprising the steps of forming a production well in such region, surrounded by injection wells, heating the oil, injecting pressurized fluid through said injection wells to drive oil in the region into a conical formation around the production well while closing off the production well to escape of oil, injecting cold solvent via the production well into a lower section of the conical formation and maintaining the formation intact to prevent escape of heat and allow thorough mixing of the solvent with the oil, heating the oil/solvent mixture and opening the production well and terminating solvent injection to allow escape of oil/solvent mixture through the production well.

4,456,066

VISBREAKING-ENHANCED THERMAL RECOVERY METHOD UTILIZING HIGH TEMPERATURE STEAM

Winston R. Shu, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 24, 1981, Ser. No. 334,345
Int. Cl.³ E21B *43/24*
U.S. Cl. 166—272 **7 Claims**



1. A method of recovering viscous oil from a subterranean, viscous oil-containing formation including tar sands penetrated by at least one injection well and a spaced-apart production well, comprising:

(a) injecting high temperature steam at the maximum allowable injection rate in an amount not greater than 0.05 pore volume into the formation to visbreak a portion of the oil contained in the formation;

(b) injecting saturated steam into the formation to drive in-place oil and the visbroken oil through the formation toward the production well, said visbroken oil decreasing fingering of said steam; and

(c) recovering fluids including oil from the formation via the production well.

4,456,067

PROCESS FOR INHIBITING HYDRATE FORMATION IN PRODUCING GAS WELLS

Felton R. Pinner, Jr., Houston, Tex., assignor to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of Ser. No. 250,801, Apr. 3, 1981, abandoned. This application Oct. 18, 1982, Ser. No. 435,016
Int. Cl.³ E21B *43/12*
U.S. Cl. 166—279 **18 Claims**

1. A process for inhibiting the formation of gas hydrates during production of hydrocarbon-containing gas from a subterranean formation penetrated by a well in fluid communication therewith, the process comprising:

(a) injecting into the formation via said well a carrier fluid having a plurality of microcapsules suspended therein, said microcapsules having walls encapsulating a gas hydrate inhibitor, said walls designed to be substantially non-degradable in the formation and substantially permeable to said inhibitor so as to provide a relatively constant release of said inhibitor into said gas over an extended period of time to prevent the formation of gas hydrates within said gas; and

(b) producing a mixture of the gas and the inhibitor from said formation, said inhibitor present in the mixture at a concentration to substantially prevent the formation of gas hydrates within said mixture.

10. A process for inhibiting the formation of gas hydrates during production of hydrocarbon-containing gas from a subterranean formation penetrated by a well in fluid communication therewith, the process comprising:

(a) injecting into the formation via said well a carrier fluid having a plurality of microcapsules suspended therein, said microcapsules having walls encapsulating a gas hydrate inhibitor, said walls predesigned to degrade within the formation at varying release times so as to provide a

relatively constant release of said inhibitor into said gas over an extended period of time; and

(b) producing a mixture of the gas and the inhibitor from said formation, said inhibitor present in the mixture at a concentration to substantially prevent the formation of gas hydrates within said mixture.

4,456,068

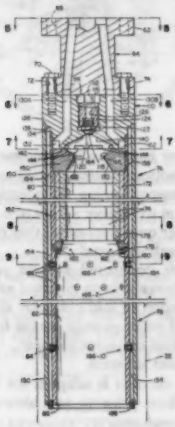
PROCESS AND APPARATUS FOR THERMAL ENHANCEMENT

Charles E. Burrill, Jr., Billerica; Martin E. Smirlock, Brimfield, and Ira P. Krepchin, Newton Upper Falls, all of Mass., assignors to Foster-Miller Associates, Inc., Waltham, Mass.

Continuation-in-part of Ser. No. 194,820, Oct. 7, 1980, abandoned. This application Aug. 28, 1981, Ser. No. 296,321

Int. Cl.³ E21B *43/24, 36/02*

U.S. Cl. 166—303 **11 Claims**



1. Thermal treatment apparatus for downhole deployment in the casing of a well for supplying an essentially particulate free mixture of gases at a high injection pressure to a downhole geologic formation comprising

combustion stage structure having ignition zone structure in which a mixture of liquid fuel and an oxidant are ignited and downstream combustion zone chamber structure that defines an elongated hot wall combustion zone of uniform cross-sectional configuration of length sufficient for the substantially complete combustion of the fuel-oxidant mixture;

elongated tubular liquid injection stage chamber structure downstream from said combustion stage chamber structure through which high temperature combustion products flow from said combustion stage chamber structure, the passage between said combustion chamber stage structure and said liquid injection stage chamber structure having a cross-sectional area at least as large as the cross-sectional area of said combustion zone, and an array of spray nozzles in the wall of said injection stage chamber structure for spraying liquid into said injection stage chamber for interaction with the stream of combustion products from said combustion zone chamber and vaporization such that an essentially particulate-free mixture of combustion products and vaporized liquid is discharged at high pressure from said injection stage chamber structure for flow into the subterranean formation to be treated, and

packer structure adjacent said combustion stage structure for sealingly engaging the casing wall of the well to provide a sealed pressure zone in which said apparatus is disposed, said packer structure having through passages for supplying fuel, oxidant, and liquid to components downstream from said packet structure.

7. A process for thermal enhancement in a downhole environment for the recovery of oil and the like comprising the steps of

providing combustion chamber structure that defines a combustion zone of length at least five times its cross-sectional width dimension;

igniting an oxidant liquid fuel mixture in said combustion chamber structure at a pressure of at least about 500 pounds per square inch, flowing the burning mixture through said elongated combustion zone to provide substantially complete combustion while maintaining the wall defining said combustion zone of said combustion chamber structure during said combustion process at a temperature in excess of 2000° F. to maximize combustion of the fuel-oxidant mixture and to provide a ready ignition source for relight;

then flowing the resulting essentially particulate-free stream of combustion products through a vaporization zone axially aligned with and downstream from said combustion zone while injecting liquid into the flowing combustion product stream to vaporize the liquid; and

then discharging the resulting mixture of combustion products and vaporized liquid at a pressure of at least about 500 pounds per square inch into the subterranean formation to be treated.

4,456,069

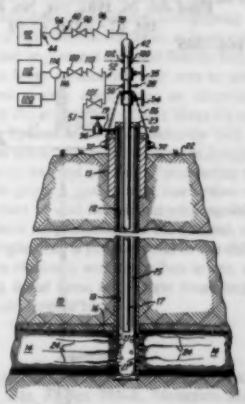
PROCESS AND APPARATUS FOR TREATING HYDROCARBON-BEARING WELL FORMATIONS

Ronald J. Vigneri, 9 Leone Ter., Kinnelon, N.J. 07405

Filed Jul. 14, 1982, Ser. No. 398,289

Int. Cl.³ E21B *43/24, 43/26*

U.S. Cl. 166—303 **14 Claims**



1. The process for increasing the yield of hydrocarbons from an underground hydrocarbon-bearing formation by stimulating the formation, the formation having internal fissures and being penetrated by a well including a borehole having an opening adjacent ground level, the process comprising the steps of:

placing and connecting a decomposition gas generator in position outside the well for supplying a relatively large volume of hot decomposition gas under pressure to the opening of the borehole;

essentially sealing the connection between the decomposition gas generator and the borehole opening so as to enable the establishment of elevated pressures within the formation;

operating the gas generator to generate decomposition gas

and inject the decomposition gas into the formation at a relatively high flow velocity and relatively high temperature, said high temperature being less than the thermal ignition temperature of the hydrocarbons in the formation; and

continuing operation of the decomposition gas generator to increase the pressure within the formation to an elevated relatively high pressure until the formation is stimulated.

7. Apparatus for increasing the yield of hydrocarbons from an underground hydrocarbon-bearing well formation by fracturing the formation, the formation having internal fissures and being penetrated by a well including a borehole having an opening adjacent ground level, said apparatus comprising:

decomposition gas generator means for operating to generate decomposition gas under pressure and in a relatively large volume at a relatively high velocity and a relatively high temperature, said high temperature being less than the thermal ignition temperature of the hydrocarbons in the formation;

means for placing and connecting the decomposition gas generator means in position outside the well for injecting said high temperature decomposition gas under pressure and in a relatively large volume at high velocity through the opening of the borehole and into the formation; and

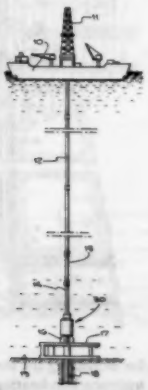
means for essentially sealing the connection between the decomposition gas generator means and the borehole opening so as to enable the injection of the high volume, high velocity decomposition gas into the formation to attain elevated pressures within the well at least until the formation is stimulated.

4,456,070

TIEBACK CONNECTION METHOD AND APPARATUS

Bruce J. Watkins, Palos Verdes, Calif., assignor to Hughes Tool Company, Houston, Tex.

Filed Jul. 26, 1982, Ser. No. 401,508
Int. Cl.³ E21B *43/01*
U.S. Cl. 166—345 **14 Claims**



1. A method of effecting a metal-to-metal type seal between a riser run from an overhead vessel and a subsea well casing suspended from a casing hanger in a subsea wellhead member, said method comprising the steps of:

lowering a mandrel attached to said riser and having a metal-to-metal type annular seal mounted at a lower end thereof into said subsea well member;

landing said annular seal on and in coaxial alignment with said casing hanger, whereby a connection between said riser and said casing is effected; and

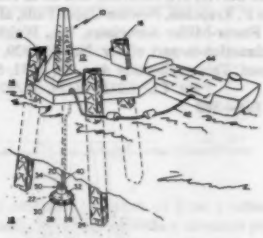
mechanically applying an axial compressive force to said annular seal, said mandrel, and said casing hanger to seal said effected connection.

4,456,071

OIL COLLECTOR FOR SUBSEA BLOWOUTS

Jerome H. Milgram, Brookline, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 16, 1981, Ser. No. 312,117
Int. Cl.³ E21B *43/01*
U.S. Cl. 166—356 **7 Claims**



1. In a collector apparatus for recovery of the effluent from a blown-out seabottom wellhead, said apparatus comprising

a collector element having an extended. open base and an upper portion to receive a flow of substantial quantities of gas and lesser quantities of oil that rise together from said seabottom wellhead, and

a riser conduit connected to said collector element and extending thereabove to conduct said fluid therefrom,

said upper portion of said collector element further including a valved relief passage means from its interior to the exterior of said collector element,

the improvement wherein

said collector element is adapted for fixable attachment to the ocean floor prior to any blow-out to define an enclosed fluid volume,

said fluid volume being sized and shaped to prevent separation of the mixture of gas and oil before reaching said riser conduit,

the base of said collector element defines an annular sealing band of significant width selected to provide substantial sealing contact with the ocean bottom about said wellhead to prevent passage of fluid therebetween,

said riser conduit is rigid and adapted to conduct the mixture of oil and gas from the interior of said element by gas lift pumping in which oil in the mixture is carried upwardly by the effects of gas in the mixture,

said valved passage is adapted to be adjusted, after gas-lift pumping of oil is established through said riser, to control the pressure differential between the enclosed volume of the collector element and the surrounding ocean to prevent pressure variation that can result in: localized scouring of the ocean bottom surrounding said wellhead; escape of released oil from said collector element; and introduction of water into said element thence into said riser, and

said collector element includes drilling port means to permit passage therethrough of a well drill to allow well drilling operations through said collector apparatus while said collector is in place upon said seabottom.

4,456,072

ICE ISLAND STRUCTURE AND DRILLING METHOD

Gilbert H. Bishop, 800 E. Ocean Blvd., Suite 801, Long Beach, Calif. 90802

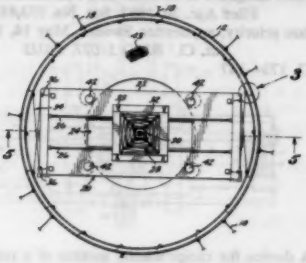
Filed May 3, 1982, Ser. No. 373,976
Int. Cl.³ E21B *7/00*; E02D *19/04*
U.S. Cl. 166—362 **23 Claims**

1. Ice island structure for location over a submerged drill site

in waters which normally freeze in winter, said ice island structure being adapted to be increased in mass to ground said structure upon the sea bottom, said ice island structure comprising:

inner wall means adapted to be surrounded by shelf ice during the onset of winter to fix the position of said inner wall means relative to said shelf ice, and wherein water and ice may be removed from within said inner wall means on grounding to afford access to the sea bottom;

a floating barge located within said inner wall means, said barge including a plurality of legs downwardly extendable



from said barge for engagement with the sea bottom for support of said barge above the sea bottom;

drilling apparatus carried by said barge and having a drilling axis, said drilling apparatus being movable on said barge whereby the location of said drilling axis is adjustable; and

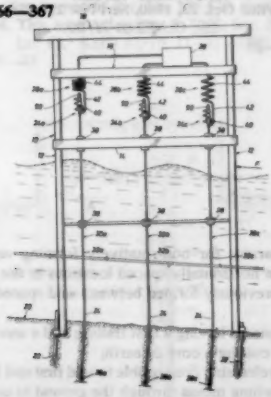
swivel means on said barge coupled to said inner wall means and operative to swivel said barge about a vertical axis for adjusting the circumferential location of said drilling axis during floating of said barge whereby said drilling axis can be maintained in substantial vertical alignment with said drill site despite shifting of said shelf ice.

4,456,073

FLEXIBLE CONNECTION APPARATUS

James R. Barth, Houston; Joe R. Fowler, Spring; Wilbur A. Hitchcock, and Jack E. Miller, both of Houston, all of Tex., assignors to Exxon Production Research Co., Houston, Tex.

Filed Aug. 24, 1982, Ser. No. 410,750
Int. Cl.³ E21B *17/01*
U.S. Cl. 166—367 **13 Claims**



1. In a compliant offshore structure having a deck located above the water surface and being subject to movement induced by wind, waves, and ocean currents, an apparatus for transporting a fluid between the sea floor and the deck of said offshore structure, comprising:

a substantially rigid, vertical riser means for transporting said fluid, said riser means having a lower end connected to the sea floor and having an upper end which extends above the water surface;

a wellhead means affixed to said upper end of the riser means, there being relative movement between said wellhead means and the deck of said offshore structure as wind, waves and ocean currents move said offshore structure; and

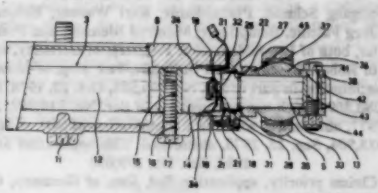
a helical flowline means having a first end connected to said wellhead means and having a second end connected to the deck of said offshore structure, said helical flowline means being capable of flexing to accommodate relative movement between said wellhead means and the deck of said offshore structure.

4,456,074

FORCE MEASUREMENT DEVICE FOR CONTROLLING THE POSITION OF AN IMPLEMENT FOR TOWING BY AN AGRICULTURAL MACHINE

Maria Prudenziati, Modena, Italy, assignor to Fiat Trattori S.p.A., Modena, Italy

Filed Feb. 1, 1982, Ser. No. 344,484
Claims priority, application Italy, Feb. 12, 1981, 67194 A/81
Int. Cl.³ A01B *63/112*; G01L *5/16*
U.S. Cl. 172—7 **5 Claims**



1. A resistive force measurement device for an implement towed behind an agricultural machine, comprising a flexure bar mounted on said agricultural machine, at least one connection arm between said implement and said flexure bar, a control system, at least one lever connecting said arm to said control system, said control system comprising an electrical circuit arranged to control the movement of said lever by means of a mechanical and/or hydraulic member, wherein said electrical circuit comprises at least one resistive element integral with a portion of said flexure bar and capable of measuring a resistive force parallel to the ground, and at least one resistive element integral with a portion of said flexure bar and capable of measuring a resistive force perpendicular to the ground, so that the resistance of said implement is proportional to the deformation which said resistive elements undergo when in use, said resistive elements being fused upon an electric insulating material which is fixed to said flexure bar.

4,456,075

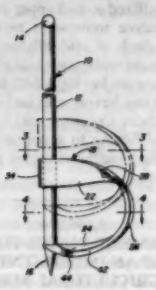
WEEDING AUGER WITH U-SHAPED BLADE

John L. Hostetter, Rte. 3, Box 385-A, Mountain Home, Ark. 72653

Filed Feb. 24, 1983, Ser. No. 469,397
Int. Cl.³ A01B *1/16*
U.S. Cl. 172—25 **11 Claims**

1. A weeding auger including an elongated upstanding shank having a ground piercing lower end and an upper end including structure for applying rotary torque to said shank, the lower end portion of said shank supporting only a single generally horizontally disposed U-shaped blade therefrom including a pair of generally parallel upper and lower arms joined at one pair of corresponding ends by an integral curved bight portion the other pair of corresponding ends of said arms being supported from said shank at points spaced therealong, at least said lower arm and the adjacent portion of said bight portion including a bevelled cutting edge extending lengthwise therealong facing outwardly of one side of an upstanding plane

containing said U-shaped blade and said shank, said lower arm including a slight twist so as to define a negative approach



angle for facilitating downward movement of the lower arm into the ground.

4,456,076

POWER-DRIVEN HAND TOOL

Wolfgang Schmid, Plattenhardt; Karl Wanner, Echterdingen; Jorg Filchle, Bempflinge; Manfred Bleicher, and Frank Müller, both of Leinfelden, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

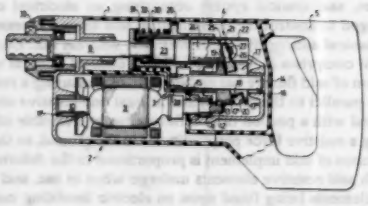
Continuation-in-part of Ser. No. 950,585, Oct. 12, 1978, Pat. No. 4,280,359, which is a continuation of Ser. No. 810,959, Jun. 29, 1977, abandoned, which is a continuation-in-part of Ser. No. 615,904, Sep. 23, 1975, abandoned. This application Jun. 30, 1981, Ser. No. 279,036

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1974, 2449191

The portion of the term of this patent subsequent to Jul. 28, 1998, has been disclaimed.

Int. Cl.³ B25D *11/10*

U.S. Cl. 173—116 **14 Claims**



1. A power-driven hammer drill, comprising a housing; a tool chuck on said housing and adapted to hold an elongated tool; an air-cushion impacting means for impacting said tool chuck in direction lengthwise of the tool, including a guide tube coaxial with said tool chuck, an impactor which is slidingly received and reciprocable in said guide tube in said direction, and a piston which is slidingly received and reciprocable in said guide tube in said direction and acts upon said impactor via an outwardly closed air cushion; and drive means for said impacting means, comprising a driven rotatable shaft mounted for rotation about an axis paralleling said direction, a drum coaxially mounted on said shaft freely turnably surrounding the same and having a circumferential surface formed with a circumferentially complete cam track, coupling means for coupling said drum for joint rotation with said shaft, and transmitting means guided by said cam track and operatively connected with said piston of said air-cushion impacting means for transmitting reciprocatory motion to the same in response to rotation of said drum with said shaft, said coupling means comprising cooperating first and second coupling portions provided on said shaft and said drum, respectively, and axially shiftable relative to one another between two positions in which said first and second coupling portions are engaged and disengaged, respectively.

4,456,077

DEVICE FOR RECIPROCATING MOTION OF A ROTATING DRILLING BODY OF A DRILLING MACHINE

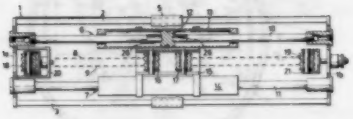
Arne Lagerstedt, and Eskil Lidstrand, both of Skärholmen, Sweden, assignors to Craelius AB, Marsta, Sweden

Filed Apr. 30, 1982, Ser. No. 373,618

Claims priority, application Sweden, May 14, 1981, 8103038

Int. Cl.³ B23Q *5/027, 5/033*

U.S. Cl. 173—147 **3 Claims**



1. A device for reciprocating motion of a rotating drilling body of a drilling machine in the longitudinal direction of a drill hole, including at least two cylinder-piston devices comprising parallel piston rods, the ends of which are supported by a frame on the machine, and cylinders movable along the piston rods, at least one of the cylinders being connected to a carriage carrying the drilling body via at least one chain or the like, characterized by means mechanically connecting two or more of the cylinders together, by a valve controlled to selectively feed a predetermined fluid flow either simultaneously to all of said two or more cylinders mechanically connected to each other, whereby the drilling body will be subjected to a relatively strong force, or to a number of these cylinders less than all of the cylinders, whereby the drilling body will be moved relatively faster.

4,456,078

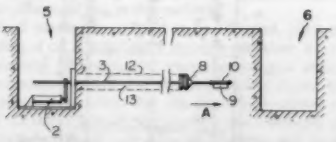
EARTH BORING METHOD AND APPARATUS

Arthur J. L. Adam, 400 Regent Ave. W., Transcona, Manitoba, Canada R2C 1R6

Filed Oct. 23, 1980, Ser. No. 199,998

Int. Cl.³ E21B *11/00*

U.S. Cl. 175—20 **57 Claims**



1. An apparatus for non-rotatively forming subterranean holes between horizontally spaced locations in the absence of a pilot hole previously formed between said spaced locations, comprising:

broaching means having a first trailing and a second leading edge for cutting a core of earth;

rod means releasably connectible to said first end for pushing said broaching means through the ground to cut said core of earth;

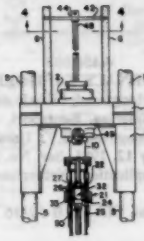
guide means disposed forwardly of said broaching means for initial penetration of the earth in the direction of said pushing to guide the movement of said broaching means between said horizontally spaced locations; and

extruding means to extrude said core of earth.

4,456,079
APPARATUS AND METHOD FOR TAKING SOIL SAMPLES

Charles L. Rassieur, Creve Coeur, Mo., assignor to Central Mine Equipment Company, St. Louis, Mo.

Filed Jul. 8, 1982, Ser. No. 396,292
Int. Cl.³ E21B 25/04
U.S. Cl. 175—58 8 Claims

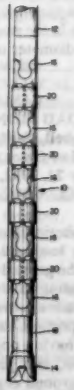


1. In apparatus for soil sampling including an outer hollow barrel and a sampling tube slidably mounted within said barrel, the improvement comprising an axially movable rotary drive table with a spindle with a central opening through it and means for coupling said barrel to it for rotation therewith, a rod having upper and lower ends, the lower end being fixedly connected to said sampling tube below said spindle, said rod extending intermediate its ends through and to a position above said spindle, and mounted above said spindle for movement axially with said table and fixed against rotary movement, whereby said sampling tube is positively restrained against rotation, and feed means for forcing said rod and barrel concurrently axially downwardly into the soil.

4,456,080
STABILIZER METHOD AND APPARATUS FOR EARTH-BORING OPERATIONS

Don R. Holbert, 6637 W. Hinsdale Ave., Littleton, Colo. 80123

Continuation-in-part of Ser. No. 188,679, Sep. 19, 1980, abandoned. This application Sep. 8, 1982, Ser. No. 415,895
Int. Cl.³ E21B 17/10, 17/20, 17/22
U.S. Cl. 175—61 21 Claims



15. The method of modifying the direction of a well bore from a curved section into a straight section comprising the steps of:

pivotally connecting a stabilizer member to a drill collar at the end of a drill bit for rotation therewith, the gauge of the stabilizer substantially corresponding to the gauge of the drill bit and being spaced from the drill bit the maximum distance a rigid body of reduced diameter, held closely to the midpoint of the hole at each end, can have and still not contact the wall of the curved hole section;

pivotally connecting additional stabilizer members to the first stabilizer member whereby to absorb change angle forces introduced by reactive formation moments;

lowering the drill bit and assembled stabilizer through the curved hole section until the drill bit is positioned at the lower terminal end of the curved hole section with its cutting edge on the bottom of the bore; and followed by

rotating the drill bit and assembled stabilizer sections to continue drilling of the well bore in the corrected direction.

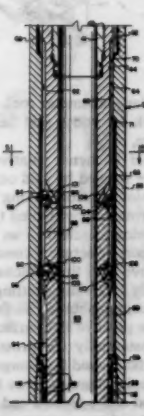
20. In apparatus adaptable for drilling a straight bore as a continuation of a curved bore wherein a rotatable drill string includes a drill bit secured to a drill collar and is rotatable with said drill string, the improvement comprising:

at least one articulated joint mounted for rotation with and between said drill string and said drill collar, a stabilizer member affixed for rotation with said drill collar and interposed between said articulated joint and said drill bit, said stabilizer having an external surface tapering both forwardly and rearwardly from an intermediate section of maximum diameter, said intermediate surface portion located relatively near the trailing end of said stabilizer and away from said leading end.

4,456,081
HYDRAULIC DRILLING JAR

James L. Newman, 970 Stacewood, Beaumont, Tex. 77706

Filed Aug. 2, 1982, Ser. No. 404,471
Int. Cl.³ E21B 31/113
U.S. Cl. 175—297 33 Claims



1. A hydraulic drilling jar adapted to be inserted in a drill stem for delivering impact blows to said drill stem in response to a longitudinally directed force applied to said drill stem and said jar, said jar comprising:

an elongated hollow cylindrical body including a lower sub for connecting said body to a drill stem member below said jar;

an elongated mandrel member slidably disposed in said body and including an upper end adapted for connecting said mandrel to said drill stem;

said mandrel having a cylindrical portion slidable through a

restricted bore portion of said body, said restricted bore portion dividing a space formed between inner bore walls of said body and said mandrel into separate axially spaced apart fluid chambers;

cooperating anvil surfaces on said mandrel and said body for delivering an impact blow to said body;

means forming a substantially fluid tight seal between said chambers when said cylindrical portion passes through said restricted bore portion of said body; and

separate passage means interconnecting said chambers and providing controlled flow of fluid from one of said chambers to the other in response to longitudinal movement of said mandrel with respect to said body to provide for axial loading of said drill stem whereby said mandrel is operable to deliver an impact blow to said body when said seal means clears a control edge to permit relatively unrestricted flow of fluid from said one chamber to said other chamber.

4,456,082

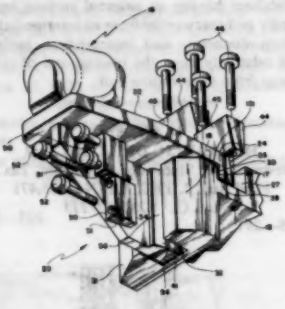
EXPANDABLE ROCK BIT

Simon J. Harrison, Azilda, Canada, assignor to Smith International, Inc., Newport Beach, Calif.

Filed May 18, 1981, Ser. No. 264,488

Int. Cl.³ E21B *10/20*

U.S. Cl. 175—384 **1 Claim**



1. An expandable large diameter rock bit comprising:

a main center rock bit body, said center body forming a support structure,

one or more cutter elements rotatively mounted to said support structure formed by said center body,

at least one extension portion having one or more of said cutter elements rotatively mounted to said extension, each said extension being attached to an outer peripheral surface of said support structure formed by said center body tongue and groove by a first attachment means such that first large radially extending abutting surfaces and second large axially extending abutting surfaces are formed therebetween with the plane of said surfaces being substantially normal to a substantially compressive load imposed on said abutting surfaces, said first tongue and groove attachment means comprises one or more tapered wedge means having a first end and a second end, said wedge tapering from a wide first end to a narrow second end, said wedge being aligned in a plane substantially parallel with a centerline of said rock bit body, said wedge means being mounted within said first groove formed in said center body, said groove forming groove wall angles that complement said one or more tapered wedges, a second attachment means substantially transverse to said first tongue and groove attachment means comprises one or more wedge means having a first end and a second end, said wedge tapering from a wide first end to a narrow second end, said wedge being aligned in a plane substantially transverse to said centerline of said rock bit body, said second attachment means is mounted between a support block formed by said center rock bit body, said support block forms a surface for said wedge means that is parallel with said centerline of said bit body, a parallel support web formed by said extension portion forms a second groove between said support web and said support block forming groove wall angles that complement said tapered wedge means, said first and second wedge means secured within said first and second grooves by wedge mounting means serve to resist twisting modes imposed by the cutting action of said cutter means during operation of said expandable rock bit.

4,456,083

BLAST FURNACE TAPHOLE DRILL

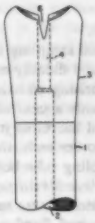
Jacobus A. Gozeling, Hoogwoud; Sibbele de Boer, Middenmeer, and Abraham A. Spiering, Santpoort, all of Netherlands, assignors to Estel Hoogovens B.V., Ijmuiden, Netherlands

Filed May 12, 1981, Ser. No. 263,083

Claims priority, application Netherlands, May 12, 1980, 8002717

Int. Cl.³ E21B *10/36*

U.S. Cl. 175—415 **3 Claims**



1. In a blast furnace taphole drill, of the type operated with both hammer action and air cleaning, said drill including a flaring head of a predetermined diameter, a head end face having four radially extending cutting edges formed by the intersection of flat faces angled to each other, said radial cutting edges defining valleys thereinbetween and a central axial air passage ending at said head end face, the improvement to said taphole drill comprising: air passages in the form of a wedge-shaped deep groove formed on said end face at the bottom of each said valley, each said groove extending radially outwardly from said central axial air passage and extending inwardly into said flaring head from said head end face, each said groove also tapering in width toward the bottom thereof and having a width at the mouth thereof and an axial depth which are respectively in the range of 7 to 13% and 20 to 40% of the predetermined diameter of said taphole drill.

4,456,084

VEHICLE LOAD MONITORING SYSTEM

Albert J. Miller, Campbell, Calif., assignor to Atlas Electronics International, Inc., Los Gatos, Calif.

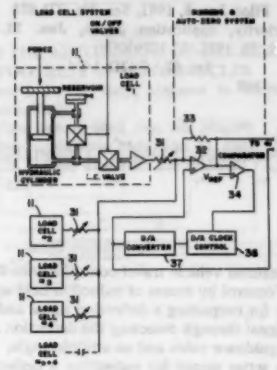
Filed May 21, 1982, Ser. No. 380,916

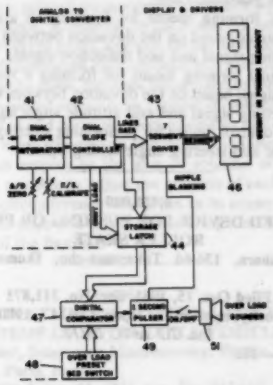
Int. Cl.³ G01G *5/06, 19/10*

U.S. Cl. 177—141 **10 Claims**

1. A system for monitoring the load added to a draft vehicle, including at least one load cell extending between the load carrying portion and the ground engaging portion of the vehicle, said load cell including passive hydraulic means for generating an hydraulic pressure corresponding to the load applied to said load carrying portion, said hydraulic means including an hydraulic cylinder having opposed chambers at either side of a translatable piston, said piston and said cylinder being secured to respective ground engaging and load carrying portions of said vehicle, one of said chambers being compressed by a load applied to load carrying portion, a closed hydraulic loop

connecting said chambers, first valve means for selectively blocking said closed loop, second valve means connected to said one chamber, pressure transducer means connected to said second valve means for generating an analog signal represent-





ing the hydraulic pressure in said one chamber when said one chamber is compressed, said first valve means is actuated to block said closed loop, and said second valve means is selectively opened, means for converting said analog signal to a digital signal, and means for displaying said digital signal.

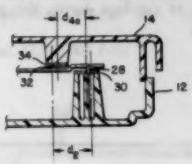
4,456,085

WEIGHING SCALE

Robert L. Boyles, Milford, Conn., assignor to General Electric Company, New York, N.Y.

Filed May 26, 1982, Ser. No. 382,177
Int. Cl.³ G01G *21/08*
U.S. Cl. 177—256 **8 Claims**

1. In a weighing scale, apparatus comprising:
a generally horizontal base member,
a generally horizontal platform member overlying said base member in vertically spaced-apart relation thereto,
force transmitting means interposed between said base and platform members for transmitting force therebetween, said force transmitting means comprising:
an upwardly facing horizontal planar bearing surface on said base member,
a downwardly facing horizontal planar bearing surface on said platform member,
a lever between said horizontal planar bearing surfaces on said base and platform members, said lever including first and second bearing surfaces projecting vertically therefrom into contact with said horizontal planar bearing surfaces of said base member and said platform member, respectively,
said first and second bearing surfaces being horizontally spaced-apart by a distance fixed within normal manufacturing tolerances, and said horizontal planar surfaces of said base platform members being horizontally



spaced-apart by a distance roughly comparable to the spacing between said first and second bearing surfaces, and the surface areas of said horizontal planar bearing surfaces being large relative to the contacting surface area of said first and second bearing surfaces,
whereby significant horizontal misalignment of said base and platform members and said horizontal planar bearing surfaces can be accommodated without affect on the forces and moments transmitted by said lever.

4,456,086

INTEGRATED WHEELCHAIR AND AMBULATOR

John P. Wier, and Robert A. Garrett, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 1, 1979, Ser. No. 62,835
Int. Cl.³ A61G *5/00*
U.S. Cl. 180—11 **2 Claims**

1. An independently maneuverable ambulator for supporting and moving a paraplegic, comprising:
a self-propelled, maneuverable base;
a framework of linkage mounted on the base for raising and lowering the paraplegic between a standing position and a sitting position;
a seat carried on said linkage to be held in a horizontal position for seating the paraplegic when said linkage is lowered, and in a substantially vertical position for supporting the paraplegic when said linkage is raised;
said linkage being articulated at substantially the knee and hip joints of the paraplegic to minimize relative movement between the surface of the seat and the paraplegic's cloth-

ing, and said linkage being telescopically adjustable to be tailored to the body dimensions of the paraplegic;

a motor-driven erection mechanism for raising and lowering said linkage, said erection mechanism comprising reversible drive means pivotally mounted on said base and reciprocating means operatively coupled to the driven means at one end and pivotally connected to the framework linkage at the one end; and

a knee restraint is mounted to said linkage to follow the movement of the legs during the raising and lowering movement.

4,456,087

VEHICLE POWER STEERING APPARATUS

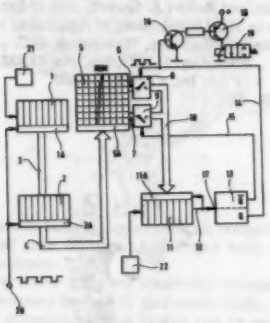
Armin Lang, Schwäbisch Gmünd, and Walter Cerny, Mutlangen, both of Fed. Rep. of Germany, assignors to Zahnradfabrik Friedrichshafen, AG., Friedrichshafen, Fed. Rep. of Germany

Filed Sep. 2, 1982, Ser. No. 414,465

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136708

Int. Cl.³ B62D 5/08

U.S. Cl. 180—142 10 Claims



1. In a fluid power steering system for a vehicle having a speed dependent signal source and an electromagnetically actuated valve (19) through which speed responsive adjustment of the system is effected, the improvement comprising means (20) connected to said source for producing speed dependent signal pulses, means for digitally processing said signal pulses, and interface means connecting the digital processing means to the electromagnetically actuated valve for intermittent operation thereof as a function of vehicle speed, the digital processing means including input counter means (1, 32) connected to the pulse producing means for measuring pulse duration and spacing of the signal pulses, intermediate storage means (2, 33) connected to the input counter means for temporarily storing the count measurements thereof, memory means (5, 35) connected to the storage means for transforming the measurements of the counter means into outputs in accordance with stored functions, a pulse length counter (11, 41), a pair of buffers (8, 9, 38, 39) transmitting the outputs of the memory means to the pulse length counter, and flip-flop means (13, 43) controlled by the pulse length counter for operation of the valve (19) through the interface means (16, 18).

4,456,088

UNMANNED VEHICLE TRAVEL CONTROL DEVICE

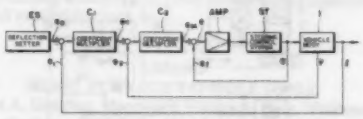
Tetsuya Nishiki, and Takao Kamide, both of Kamakura, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Jun. 8, 1981, Ser. No. 271,651

Claims priority, application Japan, Jun. 11, 1980, 55-81480[U]; Jul. 30, 1980, 55-107950[U]

Int. Cl.³ B62D 1/24

U.S. Cl. 180—168 4 Claims



1. An unmanned vehicle travel control device for performing steering control by means of induction field comprising:

a detector for outputting a deflection signal and an attitude angle signal through detecting the deflection of a vehicle from a guidance cable and an attitude angle;

deflection setter means for outputting a deflection setting signal representing a preset deflection of the vehicle body from the guidance cable,

first signal forming means for forming an attitude angle setting signal based on the deviation between said deflection setting signal and said deflection signal;

second signal forming means for forming a steering angle setting signal based on the deviation between said attitude angle setting signal and said attitude angle signal; and

a steering control device for performing steering control by means of said steering angle setting signal.

4,456,089

MOTORIZED DEVICE FOR PUSHING OR PULLING A ROLLER SKATE

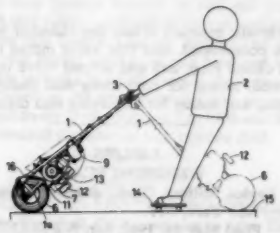
Akira Kuwahara, 136-66 Takayama-cho, Ikoma-shi, Nara, Japan

Filed Oct. 15, 1981, Ser. No. 311,871

Claims priority, application Japan, Oct. 17, 1980, 55-145927

Int. Cl.³ A63C 17/12

U.S. Cl. 180—180 4 Claims



1. A driving device for pushing or pulling a roller skater which comprises:

a longitudinally extending frame constituting a frame work:

a handle provided at the upper end portion of said frame;

a subframe coupled to a lower end portion of said frame and extending generally longitudinally therealong;

a rotary wheel means rotatably coupled to said subframe; and

a prime mover mounted on said subframe so as to drive said rotary wheel means, said rotary wheel means, subframe and prime mover being arranged and configured such that said wheel projects beyond said lower end of said frame and said prime mover is above said rotary wheel in the

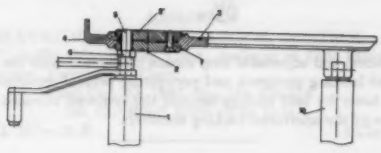
longitudinal direction of said frame whereby said driving device may push or pull a roller skater by merely changing the point of contact between a periphery of said rotary wheel and a ground surface.

4,456,090

DEVICE FOR THE ADJUSTMENT OF THE AXIS OF THE FOOTREST IN MOTORCYCLES

Franco Malenotti, Rome, Italy, assignor to Moto Laverda S.p.A., Venezia, Italy

Filed Jun. 8, 1982, Ser. No. 386,290
Claims priority, application Italy, Jun. 11, 1981, 85578 A/81
Int. Cl.³ B62J *25/00*
U.S. Cl. 180—219 **2 Claims**



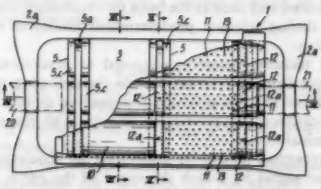
1. In a motorcycle which comprises a frame, a pedal on each side of said frame, a footrest on each side of said frame in conjunction with the pedal, a device for the adjustment of each footrest which comprises two opposite movable discs, a plate for supporting the discs, the plate being fixed to the frame, the discs being mounted so as to be capable of rotating within a cavity formed in said plate, the discs having an axis of rotation, each footrest being screwed on said discs in a position which is eccentric with respect to the axis of rotation of said discs whereby it is possible to adjust the position of each said footrest within a circumference which has as its center the axis of rotation of the discs and as the radius a segment equal to the eccentricity of the footrest.

4,456,091

SILENCER IN STAINLESS MATERIAL FOR EXHAUST SYSTEMS OF AUTOMOBILE VEHICLES

Pierre Blanchot, Soisy sous Montmorency, France, assignor to Industeler, Paris, France

Filed Jan. 25, 1982, Ser. No. 342,662
Claims priority, application France, Jan. 23, 1981, 81 01209
Int. Cl.³ F01N *7/18*
U.S. Cl. 181—282 **4 Claims**



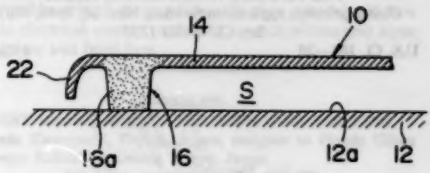
1. A silencer for the exhaust systems of automotive vehicles and the like, said silencer consisting essentially entirely of stainless steel, said silencer comprising an assembly of a pair of formed plates, a pair of shells, and a plurality of holder elements, said holder elements having a box-like cross-sectional shape having a bottom portion and a pair of wing portions extending therefrom, said shells being formed with transverse corrugation means each adapted to receive a bottom portion of one of said holder elements, the ends of said wing portions being formed to receive mating portions of said formed plates, and said shells being formed with edge flanges adapted to be crimped together to thereby secure said assembly of said holder elements, said formed plates and said shells together.

4,456,092

NOISE-SHIELDING PANEL FOR ENGINE

Takao Kubozuka, Yokosuka; Naoki Ogawa, Yokohama, and Hideya Yamaguchi, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 10, 1981, Ser. No. 300,986
Claims priority, application Japan, Sep. 22, 1980, 55-135109[U]
Int. Cl.³ E04B *1/82*
U.S. Cl. 181—290 **13 Claims**



1. A noise-shielding panel for preventing noise radiation from an engine body surface, comprising:

a flat section spacedly disposed from the engine body surface and formed of a fibrous composite; and

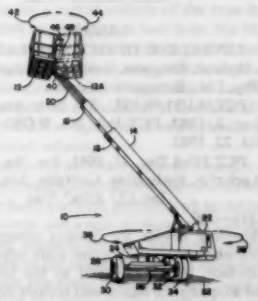
a contacting section integral with said flat section and formed of the same fibrous composite as in said flat section, and contacting section being in direct contact with the engine body surface to support therethrough said flat section spaced from the engine body surface and to maintain a seal between said flat section and the engine body surface, said contacting section being lower in density of the fibrous composite than said flat section.

4,456,093

CONTROL SYSTEM FOR AERIAL WORK PLATFORM MACHINE AND METHOD OF CONTROLLING AN AERIAL WORK PLATFORM MACHINE

David R. Finley, Irvine, and Laurence A. Beck, San Bernardino, both of Calif., assignors to Interstate Electronics Corp., Anaheim, Calif.

Filed Jun. 16, 1981, Ser. No. 274,476
Int. Cl.³ B66F *11/04*
U.S. Cl. 182—2 **23 Claims**



1. An aerial work platform machine having a base, a load carrying work platform and a boom extending there between and connected to said base and said work platform;

sensors mounted on said aerial work platform machine, the output of said sensors changing as the weight and position of loads on said work platform change;

an electronic controller connected to said sensors, said electronic controller including means responsive to changes in the output of said sensors due to said changes in weight and position for determining when a preselected safe working moment for the aerial work platform machine has been met or exceeded by the actual moment.

4,456,094

COMBI-EQUIPMENT

Hans I. Brander, Talbystrand, Södertälje, Sweden (S-151 50)

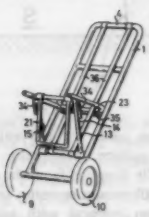
PCT No. PCT/SE81/00327, 371 Date Jul. 8, 1982, 102(e) Date Jul. 8, 1982, PCT Pub. No. WO82/01692, PCT Pub. Date May 27, 1982

PCT Filed Nov. 9, 1981, Ser. No. 403,513

Claims priority, application Sweden, Nov. 10, 1980, 8007868

Int. Cl.³ B62B *1/20*

U.S. Cl. 182—20 **4 Claims**



1. Combi-equipment functioning as transport cart and ladder, particularly boat-ladder, said equipment comprising a main frame supported by wheels and a load-carrying member, said main frame comprising two elongate, substantially parallel side frame pieces and upper and lower end frame pieces, joining the side frame pieces, as well as a number of transverse stays between the side frame parts, characterised in that the load-carrying member comprises a load-carrying frame pivotably journalled on a transverse stay or on the side frame parts, and a support frame which is pivotably journalled on the load-carrying frame, that the support frame is provided with locking means designed to be brought into engagement with either the lower end frame part of the main frame to give a first position of the load-carrying member, or with a second transverse stay of the main frame part, said second stay being located above and at a predetermined distance from said first transverse stay, to give a second position of the load-carrying member.

4,456,095

LEVELLING DEVICE FOR LADDERS

Baden L. Hodson, Enoggera, Australia, assignor to Milba Properties Pty. Ltd., Enoggera, Australia

PCT No. PCT/AU81/00193, 371 Date Aug. 3, 1982, 102(e) Date Aug. 3, 1982, PCT Pub. No. WO82/02416, PCT Pub. Date Jul. 22, 1982

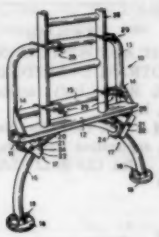
PCT Filed Dec. 23, 1981, Ser. No. 406,244

Claims priority, application Australia, Jan. 2, 1981, PE7104

Int. Cl.³ E06C *7/44*

U.S. Cl. 182—200 **6 Claims**

1. A levelling device for ladders comprising an arcuate support member having opposite ends adapted to engage a support surface, means attached to the lower portion of a ladder and adapting the ladder and arcuate support member for arcuate movement along the longitudinal axis of the arcuate support member, a pair of apertured locking members pivotally mounted on said means and receiving through the apertures thereof the arcuate support member, springs interconnecting said means and apertured locking members and biasing the latter on their pivot axes in a direction whereby the apertured locking members are released for relative movement along the axis of the arcuate support member, the placement of weight on said ladder overcoming the biasing force of said springs and moving the apertured locking members on their pivots to positions of positive locking with the arcuate support



member, and adjustable stop means connected with the apertured locking members and preventing pivotal movement of the latter by said springs beyond the required released positions of the apertured locking members.

4,456,096

TERMINAL SLOWDOWN APPARATUS FOR ELEVATOR

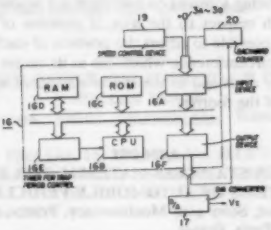
Ryuichi Kajiyama, Inazawa, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 28, 1982, Ser. No. 343,773

Claims priority, application Japan, Jul. 6, 1981, 56-105284

Int. Cl.³ B66B *1/30*

U.S. Cl. 187—29 R **3 Claims**



1. A terminal slowdown apparatus for slowing down an elevator car to stop the car at a terminal floor, wherein a normal speed command signal and a terminal slowdown signal are generated and used as the basis for controlling the speed of the car during selected predetermined modes of operation, comprising:

plural terminal detectors disposed at predetermined distances from said terminal floor for detecting passage of said car and for producing respective detection signals indicative of the position of said car with respect to said terminal floor;

first processor means for generating an acceleration command signal by which the speed of the car is increased from starting of the car at an acceleration lower than an acceleration of the car produced during the starting of the car during a saturation fault of the normal speed command signal;

at least one of said terminal detectors placed at a position at which normal slowdown operation of said car is started, said position determined in accordance with the rated running speed of said car and placed at a point wherein the acceleration command signal is equal to the terminal slowdown command signal;

a recalculating means coupled to said plural terminal detectors for recalculating the distance between said car and said terminal floor each time a detection signal is pro-

duced by said terminal detectors and for generating an output signal based on the recalculation distance;

a second processor means coupled to said output signal of said recalculating means for generating said terminal slowdown signals by which the elevator car is slowed down depending upon the recalculated distance between said car end the terminal floor, wherein the slowdown operation is initiated based on a detection signal from said at least one terminal detector;

a third processor means for comparing the outputs of said first and second processor means and for generating an output based on the lower of the outputs thereof as a terminal slowdown command signal by which the slowing down of the elevator car upon approaching a terminal is controlled.

4,456,097

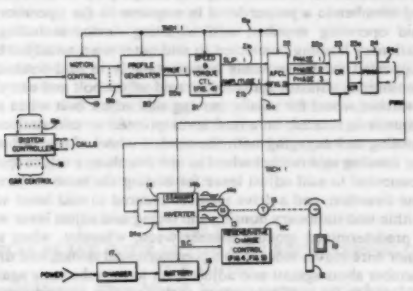
ELEVATOR BATTERY CHARGING CONTROL

Jalal T. Salihi, Manchester, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Oct. 12, 1982, Ser. No. 434,014

Int. Cl.³ B66B *5/00*; H02J *7/14*

U.S. Cl. 187—29 R **4 Claims**



1. An elevator comprising:

a battery,

a car,

a motor powered by the battery for propelling the car,

a motor control for controlling motor operation to charge the battery under certain car motion conditions,

characterized by:

a power dissipating load,

means for sensing the battery voltage and applying a load to the battery for a first interval of time if the voltage exceeds a predetermined level for a second interval of time in repeated succession.

4,456,098

BRAKE PAD WITH ELECTRICAL CONTACTS FOR BRAKE WARNING SYSTEMS

Jaan Lindre, Benfleet, England, assignor to Ford Motor Company, Dearborn, Mich.

Continuation of Ser. No. 204,665, Nov. 6, 1980, abandoned. This application Apr. 18, 1983, Ser. No. 485,374

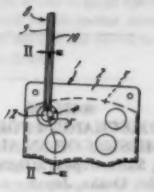
Claims priority, application United Kingdom, Nov. 20, 1979, 7940093

Int. Cl.³ F16D *66/02*

U.S. Cl. 188—1.11 **10 Claims**

1. A brake pad comprising:

a layer of friction material having a front face operably engagable to a braking surface, and an electrical lead terminating in a contact, the contact being held in position within a recess in the layer of friction material below said front face by a body forming a friction fit within said recess, such that upon a predetermined amount of abrading of the layer of friction material, the contact becomes exposed and abuts the braking surface when the brake is operated, the electrical lead including a flexible strip of insulating material having deposited thereon at least one



flexible strip of electrically conductive material which is in electrical contact with said contact within said layer below said front face.

4,456,099

DISK BRAKE APPARATUS WITH COOLING FINS

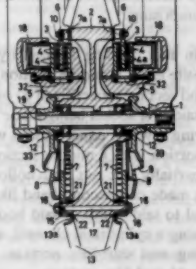
Takeshi Kawaguchi, Fujimi, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 1, 1981, Ser. No. 236,496

Claims priority, application Japan, Feb. 22, 1980, 55-21076[U]; Feb. 22, 1980, 55-21077[U]; Feb. 22, 1980, 55-21078[U]; Feb. 22, 1980, 55-21079[U]; Mar. 10, 1980, 55-29857[U]

Int. Cl.³ F16D *65/847*, *65/12*

U.S. Cl. 188—71.6 **10 Claims**



1. In a disk brake for a motor vehicle of the type including an annular brake disk carried by a wheel hub, the hub being rotatably mounted on an axle, and a caliper brake mechanism carried by a stationary support and extended through a central opening of the brake disk, the brake mechanism having brake pads engaging with opposite radial faces of the brake disk upon application of force thereto by a piston and cylinder arrangement, the improvement wherein:

said stationary support comprises a cover member directly supported on the axle and secured so as not to rotate, said cover member having a front portion with an air introducing opening therein and a rear portion with a brake mechanism receiving opening therein, the cover member enclosing that face of the brake disk which faces outwardly of the wheel hub, the brake mechanism receiving opening having side edges, the brake mechanism being mounted on the cover member in the receiving opening so as to be axially movable but secured from circumferential movement by engagement with said side edges, and

fins are provided on the brake disk at a position radially outwardly of the brake pads and of an outer periphery of said cover member, said fins extending axially and radially of at least one face of the disk and comprise impellers for

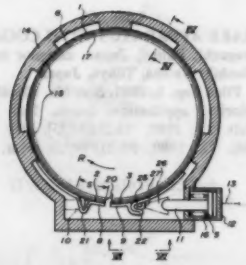
enhancing flow of air past the disk and for enhancing dissipation of heat from the disk.

4,456,100

BAND BRAKE MECHANISM FOR AN AUTOMATIC TRANSMISSION OF AN AUTOMOBILE

Takayuki Masaki, Suita, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Aug. 4, 1981, Ser. No. 289,873
Int. Cl.³ F16D 65/06, 49/06
U.S. Cl. 188—77 R 2 Claims



1. A band brake mechanism for an automatic transmission of an automobile comprising:

a housing;

a band hoop in said housing formed by thin spring steel having opposite ends, a middle portion, and a width;

a first socket and second socket fixed to opposite ends of the band hoop, said first socket being made of a first band-like member having a width equal to said width of said hoop and a bent portion with a middle section, the middle section being partially cut out and hollowed, said second socket being made of a second band like member, having a width equal to said width of said hoop, a curl-like bent portion forming a cylindrical channel, and a cut-and-bent portion facing said curl-like portion with a curvature opposite to said curl-like portion;

an anchor fitted into said middle section of said first socket;

a pin fitted into and held in said cylindrical channel by said cut-and-bent portion with the pin contacting said channel across the full width of said second socket;

a brake drum around which the band hoop is arranged;

two parallel spaced friction linings circumferentially fixed to the inner surface of the band hoop for pressing the brake drum having a space therebetween;

an aperture through said hoop into said space;

the curvature radius of the middle portion of the band hoop in a free condition being longer than that of the portion between the middle portion and each end of the band hoop;

the size and form of the band hoop being preshaped so that the band hoop occupies a position by its own elasticity in which any portion of the band hoop is not in contact with the drum when the band hoop is in set position before braking;

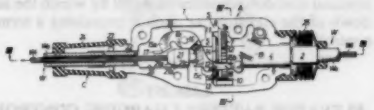
projections integrally formed with said housing being arranged around the band hoop for supporting and locating the band hoop in the set position, so that the full length of the band hoop keeps a constant space to the peripheral surface of the drum.

4,456,101

VEHICULAR BRAKE OPERATING SYSTEM

Sadashi Yamamoto, Wako; Hiroshi Kayama, Sakato, and Masaki Watanabe, Urawa, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,799
Claims priority, application Japan, Nov. 8, 1980, 55-157433; Jun. 15, 1981, 56-91745; Jul. 16, 1981, 56-111365
Int. Cl.³ F16D 65/38
U.S. Cl. 188—196 BA 13 Claims



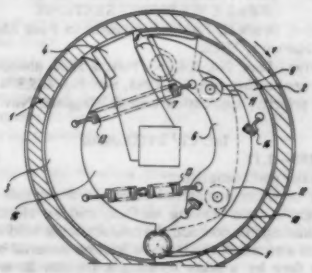
1. A vehicular brake operating system comprising: a wheel brake; an operating member; a control wire connecting said wheel brake and said operating member, said control wire including an outer wire and an inner wire inserted into said outer wire; and an adjusting device disposed midway of said control wire for automatically adjusting a play of said operating member to a proper level in response to the operation of said operating member; said adjusting device including: a stationary housing connected to said outer wire; an adjust bolt supported axially movably but irrotatably in said stationary housing; an adjustor threaded on said adjust bolt and carrying a ratchet wheel for axially moving said adjust bolt when said adjustor is rotated; an adjust lever pivoted to said stationary housing and engaging with the ratchet wheel of said adjustor for rotating said ratchet wheel in one direction; a return spring connected to said adjust lever for biasing the same to turn in one direction; and a drive member secured to said inner wire within said stationary housing and facing said adjust lever with a predetermined spacing therebetween, whereby, when said inner wire moves more than a predetermined stroke, said drive member abuts against said adjust lever to turn the same against the biasing force of said return spring so that said adjustor is rotated together with said ratchet wheel thereby to force said adjust bolt to axially protrude out of said stationary housing.

4,456,102

OVERRUNNING WHEEL BRAKE

Josef Peitz, Michaelstr. 31, Schloss Neuhaus-Sennelager, Fed. Rep. of Germany

Continuation of Ser. No. 202,445, filed as PCT DE 79/00/33, Nov. 9, 1979, § 102(e) date June 25, 1980, abandoned. This application Sep. 30, 1982, Ser. No. 432,392
Claims priority, application Fed. Rep. of Germany, Nov. 10, 1978, 2848744
Int. Cl.³ B60T 7/20; F16D 51/46, 51/60
U.S. Cl. 188—331 6 Claims



1. An overrunning wheel brake comprising a brake drum; two brake shoes including a first brake shoe which, upon

forward movement will be leading, and a second brake shoe;

a bracket member provided with two guiding parts arranged to support said first brake shoe so that said bracket member and said first brake shoe are movable relative to one another in a circumferential direction and said first brake shoe can also move in a radial direction relative to said bracket member, but during travelling in reverse, and first brake shoe supported by said bracket member cannot be moved in the circumferential direction by said second brake shoe, and during traveling forward said first brake shoe acts upon said second brake shoe;

a tensioning member formed as a cam and mounted eccentrically, said tensioning member acting directly on said bracket member and expanding said bracket member in direction toward said drum and acting in running up direction of said first brake shoe;

two inclines provided on said first brake shoe in the region of its contact with said guiding parts of said bracket member, said first brake shoe having an outer curvature, and said inclines of said first brake shoe forming relati.e to said outer curvature a wedge surface tapering in the running-up direction of said first brake shoe;

a section provided on said first brake shoe and arranged so that said inclines transit into said section as seen in the running up direction, and said section is concentrical to the outer curvature of said first brake;

an abutment member; and

a displaceable pin movable in a circumferential direction relative to said brake drum arranged so that said brake shoes abut via said pin against one another and against said abutment member, said bracket member having a first end facing toward said tensioning member, and a second end facing away from the latter and abutting via said pin against said second brake shoe.

4,456,103

DRUM BRAKE WITH AUTOMATIC RECENTERING OF THE SHOES

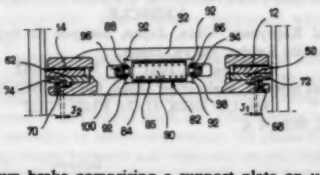
Gérard Muscat, Blanc-Mesnil, France, assignor to Societe Anonyme DBA, Paris, France

Filed Dec. 21, 1981, Ser. No. 332,800

Claims priority, application France, Jan. 23, 1981, 81 01258

Int. Cl.³ F16D *51/24, 65/00*

U.S. Cl. 188—326 **6 Claims**



1. A drum brake comprising a support plate on which is mounted in sliding relationship two brake shoes capable of being brought into friction engagement with a rotating drum by brake shoe expansion means interposed between adjacent first ends of the shoes, said first ends retracted towards each other by resilient means, brake motor means interposed between adjacent second ends of the shoes, a strut interposed between and operatively connected to the second ends of said shoes, second resilient means retracting the second ends of the shoes into engagement with said strut, said strut having an opening therethrough including shoulders, abutments fixed relative to the support plate and extending into the opening of the strut, a free-floating recentering device disposed within said opening and comprising two slidable elements each engaging peripheral areas about the opening of said strut to provide slidable engagement therebetween, and spring means disposed between and supported by the slidable elements, said slidable elements each engaging a respective shoulder and abutment whereby activation of said brake motor means effects expansion of the second ends of the brake shoes and operatively effects expansion of the first ends including circumferential rotational displacement of the shoes relative to said brake motor means so that the shoes engage the rotating drum and upon deactivation of said brake motor means the recentering device effects return of said brake shoes to a central position relative to the rotating drum.

4,456,104

HYDRAULIC ACTUATOR FOR A VEHICLE INTERNAL SHOE-DRUM BRAKE

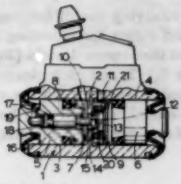
Ivan Mortimer; Glyn P. R. Farr, both of Warwickshire, and Alfred Yardley, Worcestershire, all of England, assignors to Lucas Industries Limited, Birmingham, England

Filed Aug. 20, 1981, Ser. No. 294,439

Claims priority, application United Kingdom, Aug. 23, 1980, 8027508

Int. Cl.³ F16F *65/24*

U.S. Cl. 188—349 **4 Claims**



1. An hydraulic actuator for a vehicle internal shoe-drum brake, said actuator comprising a piston and cylinder assembly having relatively movable parts, said assembly comprising a housing, means defining a cylinder bore in said housing, pistons working in said bore, and means defining pressure spaces in said housing, fluid in said pressure spaces acting on respective pistons in order to apply said brake, and said actuator incorporating a pressure proportioning valve for controlling communication between said pressure spaces, said valve being normally open to equalise the pressure in said pressure spaces and said valve being adapted to close when a predetermined pressure is reached so that further increase in pressure is operative in only one said pressure space, the pressure in the one said pressure space acting to keep said valve closed, said assembly being provided with a partition in said bore to separate said pressure spaces from each other, said partition having an opening, and said valve comprises a head for engagement with a seating surrounding said opening and a stem carrying said head, means defining a longitudinal bore in said piston on the opposite side of said partition from said seating, said stem working in said longitudinal bore and a compression spring acting between said head and said partition to urge said head away from said seating.

4,456,105

PIECE OF LUGGAGE, MORE ESPECIALLY A SUITCASE OR DOCUMENT CASE

Andre G. Seynhaeve, Senlis, France, assignor to Societe Delsey, Bobigny, France

Filed Dec. 17, 1981, Ser. No. 331,759

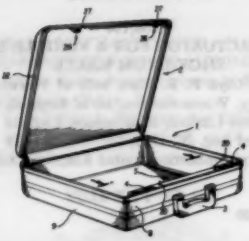
Claims priority, application France, Jan. 2, 1981, 81 00021

Int. Cl.³ A45C *13/10, 13/28*

U.S. Cl. 190—115 **13 Claims**

1. A piece of luggage, more especially a suitcase or document case, of the type comprising a bottom to which a lid is hinged, a handle provided with means for mounting same on the external face of the front wall of the bottom and two closure devices each adapted to cooperate with a keeper for locking the lid to the bottom, characterized in that the keepers (4) are made as a single separate unit (5) which has two longitu-

dinal sides and two bores and which is fixed against the internal face of the front wall of the bottom (1) by the means (17, 19) for mounting a handle (3), said separate unit being inserted between two parallel gutters (6, 7) provided on the internal face of a shaped metal section (8) forming the lateral walls of the bottom (1), these two gutters being turned towards one another and each receiving one of the longitudinal sides of the separate unit, said means for mounting passing through said bores, and in that the closure devices (26) are mounted on the front wall of the lid (2) and each closure device comprises a hook (27) adapted to engage with the corresponding keeper when the lid is closed, wherein said keepers are located on opposite sides of said means for mounting the handle.



4,456,106

DRIVE FOR A VEHICLE EQUIPPED WITH A BRAKE

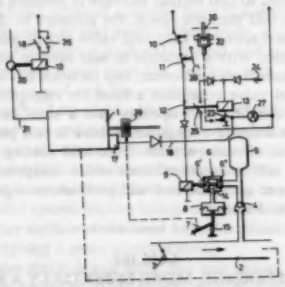
Arthur Schneider, Brunswick, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 3, 1981, Ser. No. 326,663

Claims priority, application Fed. Rep. of Germany, Dec. 5, 1980, 3045874

Int. Cl.³ B60K *41/28*

U.S. Cl. 192—0.055 **5 Claims**



1. A drive for a vehicle having wheels, a brake, an internal combustion engine, and an overrunning device for disengaging the engine from the vehicle wheels upon torque reversal, comprising:

first sensing means for measuring the temperature in the vicinity of the brake and for producing a temperature signal when the temperature exceeds a predefined temperature value;

second sensing means for sensing actuation of the brake; and

means for reengaging the engine with the vehicle wheels in response to said temperature signal and actuation of the brake.

4,456,107

SPEED CHANGE CONTROL APPARATUS AND METHOD FOR AUTOMATIC TRANSMISSION

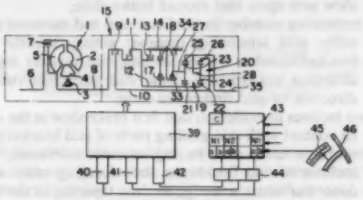
Hiroshi Ito, and Sinsuke Kusumoto, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kaboshiki Kaisha, Toyota, Japan

Filed Oct. 19, 1981, Ser. No. 312,929

Claims priority, application Japan, Oct. 31, 1980, 55-152182

Int. Cl.³ B60K *41/28*

U.S. Cl. 192—3.31 **12 Claims**



1. Speed change control apparatus for an automatic transmission of a vehicle, comprising:

(a) a fluid-type torque converter;

(b) a transmission gear directly connected to said torque converter and comprising a plurality of friction-engaging elements for performing speed changes of the vehicle;

(c) a direct coupled clutch operable between engaged and disengaged conditions, and connected in parallel with said torque converter;

(d) a hydraulic servo for operating said direct coupled clutch and said friction-engaging elements;

(e) an electromagnetic valve for controlling oil pressure to said hydraulic servo in response to vehicle speed and engine load; and

(f) disengagement means coupled to an accelerator pedal of the vehicle for maintaining said direct coupled clutch in the disengaged condition for a predetermined time after return speed of the accelerator pedal exceeds a predetermined value.

4,456,108

CONTROL SYSTEM FOR A FOUR-WHEEL DRIVE VEHICLE

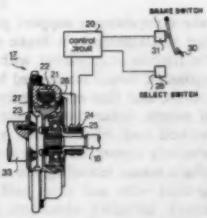
Hayashi Kageyama, Ohta, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 18, 1981, Ser. No. 303,452

Claims priority, application Japan, Oct. 9, 1980, 55-142260

Int. Cl.³ B60K *41/24*; F16D *37/02*

U.S. Cl. 192—4 A **7 Claims**



1. In a system in a vehicle for controlling a clutch of a disengageable four-wheel drive powered by an internal combustion engine, the vehicle having a vehicle braking condition detector, a transmission operatively connected to a crankshaft of said engine for transmitting power of said engine, a final reduction device connected to an output gear of said transmission for

transmitting the output of said transmission to two main driving wheels of the vehicle, the clutch when engaged for further transmitting said output of said transmission to two auxiliary driving wheels of the vehicle, and the system having a select switch operatively connected to said clutch through a control circuit means for selectively engaging said clutch, the improvement in the system which comprises

switch means operatively connected with said vehicle braking condition detector for producing an output signal when the vehicle is in a braking condition, and

said control circuit means is responsive to said output signal for engaging said clutch so as to establish the four-wheel drive when the vehicle is in the braking condition.

4,456,109

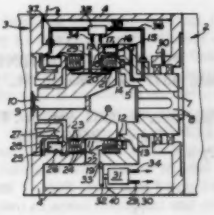
TRANSMISSION COUPLING INCLUDING A CLUTCH-BRAKE COMBINATION

Eric Bottomley, Barnsley, and Malcolm C. Foster, Wakefield, both of England, assignors to Fletcher Sutcliffe Wild Limited, England

Filed Sep. 11, 1981, Ser. No. 301,123

Int. Cl.³ B60K *41/24*

U.S. Cl. 192—18 A **16 Claims**



1. A transmission coupling for location between an electric motor and a gear box, comprising:

(a) a rigid housing;

(b) an input shaft rotatably supported within said housing;

(c) an output shaft also rotatably supported within said housing;

(d) a hydraulically actuated multi-plate clutch, at least one of said clutch plates being rigidly connected to said input shaft and at least one of said clutch plates being rigidly connected to said output shaft, said clutch being hydraulically operative to selectively engage the plates for transmitting torque between said input and output shaft;

(e) a multi-plate brake, at least one brake plate being rigidly connected to said output shaft and at least one brake plate being rigidly supported by said housing, said brake being hydraulically operative to selectively engage and disengage the brake plates on the output shaft and housing to selectively inhibit rotational movement of said output shaft with respect to said housing;

(f) a constant pressure hydraulic pump interconnected by a hydraulic circuit to said clutch and said brake for supplying hydraulic fluid at a constant pressure to effectuate operation of said clutch and said brake, whereby fluid output of the pump is automatically adjusted in response to fluid volume demanded by operation of said clutch and said brake; and

(g) control valve means disposed in said hydraulic circuit intermediate said pump and the brake and clutch for controlling flow of hydraulic fluid from said pump to both said clutch and said brake.

4,456,110

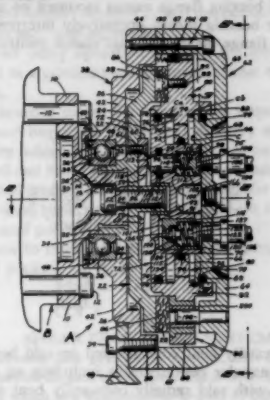
SELF-CONTAINED FAN CLUTCH

James V. Hanks, Minneapolis, and Leonid Dayen, Plymouth, both of Minn., assignors to Horton Industries, Inc., Minneapolis, Minn.

Continuation of Ser. No. 205,619, Oct. 11, 1980, abandoned. This application Jul. 26, 1982, Ser. No. 401,591

Int. Cl.³ F16D *43/25, 31/02, 25/063*

U.S. Cl. 192—82 T **36 Claims**



1. A self-contained clutch having no external controls comprising, in combination: a first member for connection to a source of power; a second member rotatably mounted with respect to the first member; a drive disc in the same rotational position as the first member; friction facing means reciprocally carried by the second member for engagement with the drive disc; an environment sensing member carried by the second member; and means actuated by the first member and the condition of the environment sensing member for causing the friction facing to contact the drive disc when the environment sensing means senses a first environment range and to disengage the friction facing from the drive disc when the environment sensing member senses a second environment range so that when the condition of the environment sensed by the environment sensing means is within a first range, the friction facing is disengaged from the drive disc and thus the first and second members are not rotatably interrelated but when the condition of the environment sensed by the environment sensing means is within a second range, the friction facing is engaged with the drive disc and the first and second members are rotatably interrelated.

4,456,111

HYDRAULIC CONTROL SYSTEM FOR A CLUTCH

Bernhard Limbacher, Niederwerrn, Fed. Rep. of Germany, assignor to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 16, 1981, Ser. No. 321,523

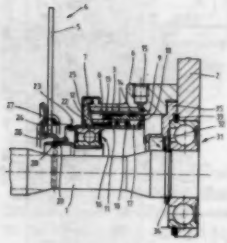
Claims priority, application Fed. Rep. of Germany, Nov. 22, 1980, 3044048

Int. Cl.³ F16D *25/08, 23/14*

U.S. Cl. 192—85 CA **13 Claims**

1. A hydraulically controlled release system for a friction clutch operatively interposed between a clutch control member of said clutch and transmission means including a transmission housing and a primary transmission shaft comprising: annular cylinder means supported on said transmission housing, said annular cylinder means comprising a cylinder housing attached to said transmission housing and containing a hydraulic connection for introducing hydraulic fluid into a pressure space, said cylinder housing forming the radially outer side of said annular cylinder means, and a cylinder liner forming the

radially inner side of said annular cylinder means; annular piston means operatively engaged within said cylinder means; said cylinder means and said piston means being concentrically arranged with respect to said primary transmission shaft; said pressure space defined between said cylinder means and said piston means; hydraulic means in flow communication with said pressure space for driving said piston means to effect operation of said clutch; bearing flange means movably guided radially inwardly of said piston and cylinder means; a guide ring for said bearing flange means mounted on said cylinder liner; release bearing means operatively interposed between said bearing flange means and said clutch control member; a



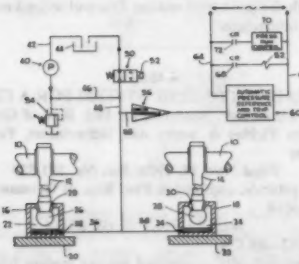
radially outwardly bent edge formed on said bearing flange means; said annular piston means including an end face in engagement with said radially outwardly bent edge of said bearing flange means for actuating said release bearing means thereby to effect controlled operation of said clutch; and an initial load spring arranged in an annular space between said cylinder liner and said bearing flange means in the region approximately radially within said annular piston means for maintaining continuous contact between said release bearing means and said clutch control member, said initial load spring being supported on one side thereof at said cylinder liner and at the other side thereof at said bent edge of said bearing flange means.

4,456,112

OVERLOAD CONTROL FOR MECHANICAL POWER PRESSES

Clarence O. Jones, Jr., Eggertsville, N.Y., assignor to Niagara Machine & Tool Works, Buffalo, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,881
Int. Cl.³ F16P *5/00*
U.S. Cl. 192—150 **9 Claims**



1. In a mechanical press having frame means including a bed, a reciprocable slide supported by said frame means for movement toward and away from said bed, drive means for reciprocating said slide, and hydraulic means operatively associated with said slide for developing hydraulic pressure proportional to pressing force, the improvement comprising:

(a) transducer means having an input operatively connected to said hydraulic means for providing an electrical output signal having a magnitude proportional to said hydraulic pressure and a rate of change proportional to the change in magnitude of said hydraulic pressure;

(b) signal processing circuit means having an input connected to said transducer means and having an output, said circuit means providing an output signal in response to a predetermined minimum change in the magnitude of the electrical output signal from said transducer means and in response to a predetermined minimum rate of change in the magnitude of the output signal from said transducer means; and

(c) control means connected to said circuit means and operatively coupled to said press drive means for stopping said press drive means in response to an output signal from said circuit means;

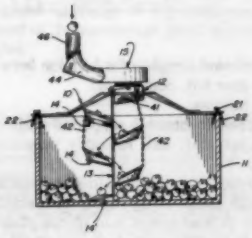
(d) whereby when the output signal from said transducer means changes suddenly due to an actual overload on said press said circuit means responds to cause stopping of said press drive means and whereby said circuit means does not respond to a relatively slower change in the output signal from said transducer means resulting from a slow change in hydraulic pressure during non-overload conditions.

4,456,113

PICKING IMPLEMENT

Alphée Thibault, 4347 Charlemagne St., Montreal, Canada H1X 2H2

Filed Dec. 16, 1981, Ser. No. 331,145
Int. Cl.³ B65G *11/08*
U.S. Cl. 193—7 **10 Claims**



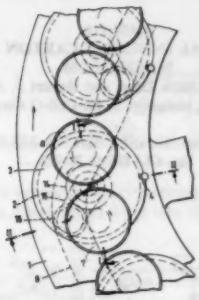
1. A fruit-picking implement comprising a support frame adapted to be mounted across the open top of fruit-collecting container, a hanger bracket suspended from said support frame to extend within said container, a plurality of rigid fruit-braking shelves carried by said hanger bracket spacedly along the same and adapted to be covered by fruits in said container, at least some of said shelves being pivotally connected to said hanger bracket for upward pivotal movement from a collapsed position alongside said hanger bracket, said shelves being arranged in vertically-spaced and alternate side tiers on opposite sides of said hanger bracket, tie means detachably maintaining said pivoted shelves in an operative position drooping angularly towards the next lower shelf of an opposite tier, said pivoted shelves taking said collapsed position when detached from said tie means to allow upward removal of said hanger bracket and shelves from within said container, even when full of fruits, and a fruit channel means mounted on said support frame over said hanger bracket and constructed to channel a fruit onto the topmost shelf of said shelves.

4,456,114

TURRET COMPRISING TURNTABLES FOR BOTTLES IN A BOTTLE-HANDLING MACHINE, AND MORE PARTICULARLY A LABELING MACHINE

Hans-Werner Mohn, Kaarst, Fed. Rep. of Germany, assignor to Jagenberg AG, Dusseldorf, Fed. Rep. of Germany

Filed Dec. 17, 1981, Ser. No. 331,939
Claims priority, application Fed. Rep. of Germany, Jan. 7, 1981, 3100197
Int. Cl.³ B65G 29/00
U.S. Cl. 198—377 4 Claims



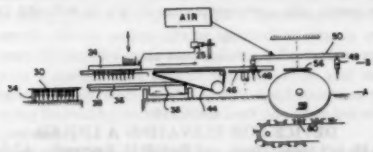
1. In a bottle handling machine, a turret for transport of bottles comprising a plurality of cam-follower controlled turntables arranged in a circle and driven by first gears, a plane fixed cam operatively connected to the turret so that as the turret revolves the cam is contacted by the cam followers of the turntables, each follower having a lever arm guided in said cam, movement of each lever arm rotating the associated turntables back and forth, and a second gear meshing with each associated turntable and joined to said lever arm, the second gear joined to each lever arm being disposed between the first gears to two adjacent turntables and meshing with said first gears.

4,456,115

SYRINGE INSPECTION APPARATUS

Hugh P. McKnight, Indianapolis; Kenneth B. Welty, and Harold B. Dinius, both of Mooresville, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed May 3, 1982, Ser. No. 373,979
Int. Cl.³ B65G 29/00
U.S. Cl. 198—377 11 Claims



1. Inspection apparatus for inspecting filled hypodermic syringes or the like having a needle end and an opposite open end provided with a finger flange, comprising

presenting means to present a row of a plurality of syringes for loading,

an infeed conveyor comprising a pair of spaced rails or like conveyor elements adapted to receive syringe bodies between them and to engage beneath the finger flanges thereof to support the syringes in depending relation,

a gang chuck having a plurality of expansible inserts and automatic means to move the chuck to enter the inserts in the open ends of a plurality of syringes, expand the inserts to grip the syringes, and carry the syringes to and release the same onto said infeed conveyor,

drive means to move the syringes along the conveyor in depending position,

a continuously moving chuck carrier having a continuous series of inspection chucks having expansible inserts at the bottom thereof,

infeed transfer means for transferring the depending syringes from said infeed conveyor to said inspection chucks on the continuously moving carrier,

said carrier being operative to carry the syringes on said chucks in a continuous series past at least one inspection station,

outfeed transfer means for transferring inspected syringes from said inspection chucks to a delivery wheel, and

a delivery wheel rotatable on an axis at an angle to the vertical end having pockets therein to receive syringes in a vertical position from said outfeed transfer means, and to carry them about said angled axis and tilt them toward a horizontal position,

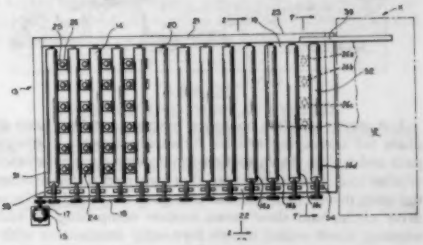
and means to release the tilted syringes from the delivery wheel pockets.

4,456,116

SHEAR FRONT FEED SYSTEM

David J. Jarman, Box 181, RR 3, Aurora, Ind. 47001

Continuation-in-part of Ser. No. 122,249, Feb. 19, 1980, abandoned, which is a continuation-in-part of Ser. No. 844,736, Oct. 25, 1977, abandoned. This application Jun. 28, 1982, Ser. No. 393,060
The portion of the term of this patent subsequent to Jan. 17, 1995, has been disclaimed.
Int. Cl.³ B65H 11/02, 9/00
U.S. Cl. 198—414 5 Claims



1. In a shear front feed system for feeding sheet metal into the front of a shear, said shear of the type having a squaring arm for aligning a lateral edge of sheet metal to be fed to the shear, and including a feed system having: conveyor means to convey said sheet metal to the front of said shear for shearing operations; said conveyor means including a sheet metal receiving end remote from said shear and a sheet metal transfer end adjacent said shear as well as a plurality of parallel, spaced apart, powered roller means for moving the sheet metal from said receiving end to said transferring end; ball transfer means free to rotate in any direction mounted on said conveyor means for facilitating the movement of the sheet metal from the direction actuated by the roller means to thereby present the sheet metal at a selected one of various angles to the blade of the shear; means for lifting said ball transfer means to a position above said powered roller means to separate said sheet metal from said roller means for reorientation of said metal upon said roller means, said feed system further comprising:

squaring means for automatically conveying said sheet metal to abut said squaring arm; and

said squaring means automatically inducing the convergence of said sheet metal at said squaring arm for said alignment

through continuous gravitational exertion acting in a single direction.

5. The apparatus as recited in claim 1 wherein said conveyor means further includes:

a turntable situated proximate said sheet metal transfer end adjacent said shear;

said turntable being fully rotatable about an axis perpendicular to said powered rollers for a substantial range of rotational movement;

said turntable being elevatable with respect to said powered rollers and said ball transfer means, so as to separate said sheet metal from said conveyor means for reorientation of said sheet metal upon said roller means at any selected angle within said range of rotational movement of said turntable for angled presentation of said sheet metal to said shear;

said turntable being lowerable with respect to said powered rollers and said ball transfer means after reorientation of said sheet metal so as to allow movement of said sheet metal along said rollers for presentation of said metal to said shear at said selected angle; and

shortened powered rollers flanking said turntable so as to permit movement of said sheet metal past said turntable when said turntable is in said lowered position.

4,456,117

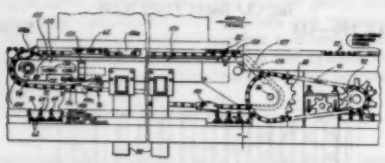
CONVEYOR WITH SLOW DOWN SECTION

Francis A. Szczepanski, Union Lake, Mich., assignor to LaSalle Machine Tool, Inc., Troy, Mich.

Filed Nov. 23, 1981, Ser. No. 323,853

Int. Cl.³ B65G *47/31*

U.S. Cl. 198—461 **4 Claims**



1. A power and free conveyor having an endless main drive chain for conveying articles forwardly along a conveyance path and a slow down section for slowing the conveyance of articles to a lesser speed than that imparted to the articles by the main drive chain without changing the speed of the main drive chain, said slow down section comprising an endless auxiliary chain which travels forwardly coextensive with the main drive along a portion of the conveyance path but at a lesser speed than the main drive chain, said auxiliary chain having forward and rear turn-arounds, one or more stops each pivotally mounted on the auxiliary chain and operable over an arc spanning an acute angle subtending its pivotal mounting relative to the auxiliary chain between an active position wherein, when the stop is traveling forwardly with the auxiliary chain along said portion of the conveyance path, it is disposed to slow an article being conveyed by the main drive chain so that the speed of conveyance of said article is reduced from that of the main drive chain to that of the auxiliary chain and an inactive position which is ineffective to slow articles, each such stop being arranged in a pivotally unbalanced condition on the auxiliary chain so as to be gravity-biased toward the active position during forward travel of the stop along said portion of the conveyance path, means against which each such stop is gravity-biased during forward travel of the stop along said portion of the conveyance path thereby serving to establish the active position of the stop, means effective to return the stop to the inactive position via said arc as the auxiliary chain traverses its forward turn-around and to maintain the stop in the inactive position during return to the rearward turn-around of the auxiliary chain until the stop reaches a point where the pivotal imbalance becomes effective to cause the stop to be displaced over said arc to the active position by force of gravity, each stop having a notch at the rear end thereof for engagement with an article to thereby slow the article, and a roller on the stop adjacent the notch which is adapted to engage an overlying workpiece to prevent the stop from assuming the active position if in fact there is an overlying article on the stop when the stop enters the conveyance path.

4,456,118

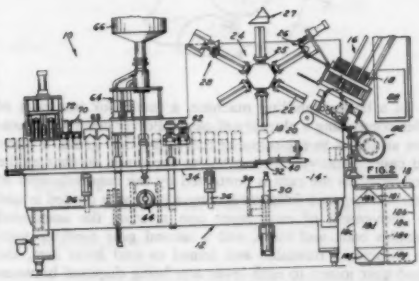
SINGLE TO DUAL INDEXING CARTON TRANSFER MECHANISM

Ivan L. Kauffman, Union Lake, and Robert J. Allen, Farmington, both of Mich., assignors to Ex-Cell-O Corporation, Troy, Mich.

Filed Nov. 18, 1981, Ser. No. 322,507

Int. Cl.³ B65G *29/00*

U.S. Cl. 198—480 **4 Claims**



1. Transfer means for transferring cartons, said transfer means comprising a turret including a plurality of equally spaced mandrels, first indexing means for indexing said turret at a predetermined rate, a stationary rail, stripping means for stripping individual cartons from respective mandrels and sequentially placing said cartons on said stationary rail, conveyor means for conveying said cartons, second indexing means for indexing said conveyor means at half the rate of said turret, and pusher means for moving said individual cartons along said stationary rail onto said conveyor means such that every other carton enters said conveyor means during its dwell periods while respective cartons in between said every other carton enters said conveyor means during its indexing cycles.

4,456,119

DEVICE FOR ELEVATING A LIQUID

Henk H. in't Hout, Hank, and Rudolf H. Loevendie, Alblasserdam, both of Netherlands, assignors to IHC Holland N. V., Papendrecht, Netherlands

Filed Aug. 7, 1981, Ser. No. 291,058

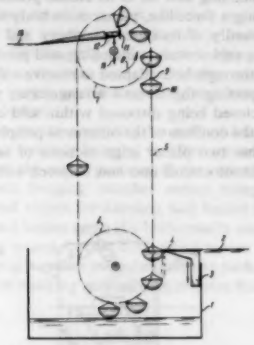
Claims priority, application Netherlands, Aug. 8, 1980, 8004528

Int. Cl.³ B65G *47/20*

U.S. Cl. 198—535 **8 Claims**

1. Device for elevating a liquid from a low level to a higher level, comprising an endless bucket conveyor, a reversing wheel adjacent said higher level over which the bucket conveyor runs, a filling tank into which the lower end of the bucket conveyor dips, means to circulate the bucket conveyor so that one run thereof ascends while another run thereof

descends, and means to supply liquid to the ascending run of the bucket conveyor at a point above the liquid level in the



filling tank, said supply means comprising a vertically adjustable slider over which liquid flows into the buckets.

4,456,120

MAT-FORMING INSTALLATION FOR PRESSEDBOARD

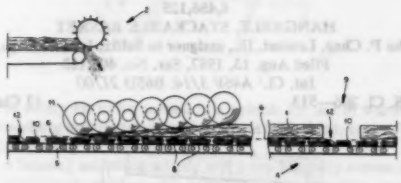
Jürgen Pesch, Krefeld-Traar, Fed. Rep. of Germany, assignor to G. Siempelkamp GmbH & Co., Krefeld, Fed. Rep. of Germany

Filed Nov. 5, 1981, Ser. No. 318,452

Claims priority, application Fed. Rep. of Germany, Nov. 7, 1980, 3042005

Int. Cl.³ B65G *49/00*

U.S. Cl. 198—648 **4 Claims**



1. A conveyor for mats of comminuted material adapted to be transformed into pressedboard, said conveyor comprising:

a traveling grate comprising a pair of spaced-apart synchronously driven endless chains spanned by closely spaced mutually parallel grate bars defining a flat surface at least over a portion of a pass of said conveyor, said surface being formed with gaps at spaced-apart locations therealong formed by omission of at least one grate bar at each gap; and

respective underlays to receive said mats and comprising entrainment beams received in the respective gaps and removably resting on said chains, a flexible web connected to each beam and overlying said surface upstream therefrom, said beams each having a lower portion which while lying in the respective gap is below said surface, and respective two-articulation piano hinges connecting each web to the respective beam whereby said webs lie flat against said surface, each of said piano hinges comprising a lower member connected to the respective lower portion of the respective beam below said surface, an upper member connected to the respective web and an intermediate member between said upper and lower members.

4,456,121

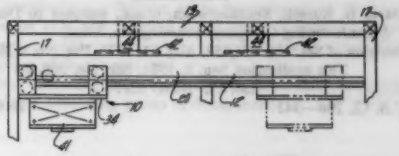
LOAD MOVING APPARATUS

Guy V. Palmer, Brighton, and Raymond J. Schihl, Dryden, both of Mich., assignors to Automatic Hydraulic Devices, Flint, Mich.

Filed Apr. 24, 1981, Ser. No. 257,143

Int. Cl.³ B61B *13/12*; B65G *25/04, 41/00*

U.S. Cl. 198—750 **13 Claims**



1. A load moving apparatus comprising: a channel shaped elongated frame having a predetermined straight length and having continuous parallel flange portions, attaching means on said frame for supporting said frame in any selected position between a vertical plane and a horizontal plane and in any position of rotation about an axis extending longitudinally of said frame, a carriage, a pair of guide members supported on said frame and extending longitudinally of said frame and at opposite sides thereof, said guide members having a substantially circular cross-section and being supported in spaced relationship to said flange portions and in parallel relationship to each other, sets of rolling elements supported in pairs on said carriage for rotation about parallel axes extending transversely to said flange portions and in rolling engagement with diametrically opposed sides of said guide members to confine and maintain said carriage relative to said guide members for all selected positions of said frame, motion transmitting means acting between said carriage and said frame independently of said rolling elements and guide members for repeated reciprocating movement of said carriage relative to said frame in all of said selected positions of said frame.

4,456,122

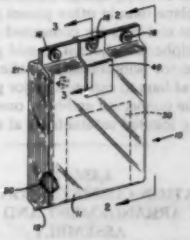
PACKAGE AND DISPLAY SYSTEM

John D. Kalal, Akron, Ohio, assignor to Schott International, Inc., Akron, Ohio

Filed Dec. 20, 1982, Ser. No. 451,085

Int. Cl.³ B65D *75/30*

U.S. Cl. 206—45.34 **3 Claims**



1. A package system for fabric goods having a plurality of grommet reinforced openings along at least one edge, comprising:

(A) a transparent cover enveloping the goods;

(B) said cover being closed along its edges and forming a support section along at least one of said edges;

(C) a plurality of grommet reinforced openings in said support section;

(D) said openings being reinforced by grommets of the same

size and physical properties as the grommets of the goods; and

(E) a strip of the same material as the goods being secured to said cover at one of said reinforced openings thereof and disposed exteriorly of said cover.

4,456,123

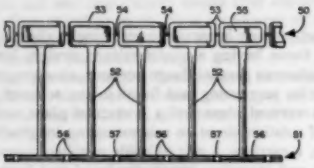
METHOD AND APPARATUS FOR DISPENSING FASTENERS

David B. Russell, Southborough, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Division of Ser. No. 071,458, Aug. 31, 1979, Pat. No. 4,288,017. This application Sep. 8, 1981, Ser. No. 300,408

Int. Cl.³ B65D *85/24*

U.S. Cl. 206—343 **10 Claims**



1. In fastener stock of the type comprising two continuous and elongated plastic side members that are cross-coupled by a plurality of filaments, the stock being proportioned to be fed as a unit to a position where individual fasteners are separated therefrom within a machine, one of said side members being proportioned so that each separated fastener includes an end-bar formed from a portion of the said side member and is configured for feeding through the bore of a hollow needle having a longitudinal slot for passage of the associated filament, and in which each filament is foldable towards the associated end-bar that is feedable through said hollow needle; the improvement adapted for continuous molding in long lengths and for feeding and dispensing individual fasteners therefrom with dispensing apparatus which advances the end fastener adjacent the rear portion of the needle bore with its end-bar transversely disposed thereto, rotates the end-bar into alignment therewith, and contacts the end of the end-bar with plunger means to sever the end-bar from the stock and force it through the bore; said improvement comprising fastener stock wherein each of said filaments is molded with a D-shaped cross-section having its maximum width at a substantialy flat plane at one side thereof, said end-bars being wider in cross-section at said plane than in other planes parallel thereto, and wherein adjacent end-bars are connected end-to-end at a portion of their peripheries adjacent to said plane by means of a severable connector substantially smaller in cross-sectional area than said end-bars to expose a major portion of the end of at least one of the connected end-bars, one face of each of said connectors being located substantially at said plane.

4,456,124

COMBINATION COSMETIC CONTAINER AND SUPPORT ARRANGEMENT AND METHOD OF ASSEMBLY

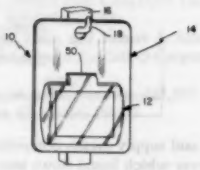
Nathan Kay, and Robin M. Kay, both of Encino, Calif., assignors to Max Factor & Co., Hollywood, Calif.

Continuation of Ser. No. 221,298, Dec. 30, 1980, abandoned. This application Nov. 12, 1982, Ser. No. 441,305

Int. Cl.³ B65D *73/00*

U.S. Cl. 206—463 **2 Claims**

1. A combination container and support arrangement, comprising: a container including a generally rectangular main section defining a compartment adapted to house a cosmetic therein, a generally rectangular lid, pivot means connecting said lid to said main section for pivotal movement between an opened position and a closed position whereby to gain access to or close off said compartment, and latching means for disengagably maintaining said lid in its closed position; and a support tab having a sheet-like, planar main body which includes a cutout inwardly of its outer periphery and configured to accommodate said container including said pivot and latching means and a through-hole adapted to receive a shelf peg or the like for supporting the overall arrangement; said container with its lid closed being disposed within said cutout and entirely within the confines of the outermost periphery of said tab body such that two planar edge sections of said main body along said cutout extend into and between said main section



and closed lid for locking said container in place within said cutout so long as said lid remains closed whereby direct access can be made into said compartment while the container remains in said cutout by merely opening said lid, thereby allowing a user or potential user to inspect or even use the cosmetic within said compartment without having to remove the container from said cutout, said cutout including cutout segments which respectively receive said pivot and latching means so that the latter are free to function without interference from the support tab, said cutout being generally rectangular with said cutout segments being disposed on opposite ends of said cutout, said edge sections of said main body extending on opposite sides of said cutout between said cutout segments.

4,456,125

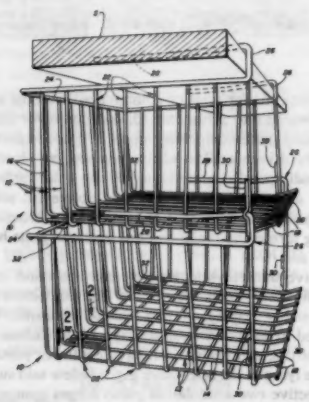
HANGABLE, STACKABLE BASKET

John P. Chap, Lemont, Ill., assignor to Selfix, Inc., Chicago, Ill.

Filed Aug. 13, 1982, Ser. No. 407,113

Int. Cl.³ A45F *3/14*; B65D *21/00*

U.S. Cl. 206—513 **12 Claims**



1. A basket adapted to hold articles, comprising:

a plurality of laterally spaced, first members generally defining the bottom of said basket;

a plurality of spaced apart, second members connected with said first members, each including portions extending

generally upward of the bottom of the basket and generally defining a pair of laterally spaced sides of said basket; and

hanging means associated with said first and second members whereby said basket is adapted to be hung from an object by said hanging means, said hanging means being adapted to cooperate with the hanging means of a like basket to permit vertical stacking and hanging of more than one basket,

said hanging means comprising a pair of laterally-spaced, rearwardly-opening hanging member means respectively disposed at the upper portions of the spaced sides of said basket, said hanging member means being adapted to receive said object for hanging said basket therefrom by moving said basket generally horizontally and rearwardly,

said hanging means further comprising means for receiving said hanging member means of said like basket for achieving vertical stacking and hanging of more than one basket.

4,456,126

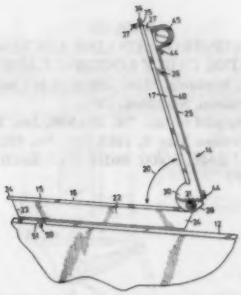
SAFETY KIT

James D. Hicks, Jr., 476 S. King St., Gastonia, N.C. 28052

Filed Feb. 4, 1983, Ser. No. 463,679

Int. Cl.³ B65D *79/00*; G09F *21/04, 13/16, 7/18*

U.S. Cl. 206—573 **3 Claims**



1. A safety kit to be carried in a vehicle for use in warning approaching motorists when the vehicle is disabled, said safety kit comprising:

a. a housing including a body and a top hingedly connected to the body and movable between a closed position covering the body and an open position extending angularly above the body;

b. an anchor rib extending from the bottom of the body of the housing for locating the housing on the exterior of the vehicle in a position where the top is in its open position is visible to approaching motorists;

c. a supply of signs normally carried in the housing;

d. lug retaining means on the exterior surface of the top for displaying a selected sign to approaching motorists when the top is in its open position; and

e. means within the housing for supporting the top in its open position.

4,456,127

DOCUMENT HANDLING MACHINE WITH TWO STAGE COLLECTION COMPARTMENT FOR GROUPING DOCUMENTS

Kenneth A. Hams, Easton, Pa., assignor to Bell & Howell Company, Phillipsburg, N.J.

Filed Aug. 31, 1981, Ser. No. 297,536

Int. Cl.³ B07C *3/02, 5/38*

U.S. Cl. 209—564 **4 Claims**

1. A document handling machine comprising:

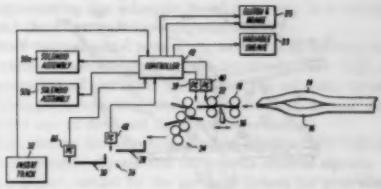
separating means for separating documents from at least one row of documents;

first detecting means for reading indicia on said documents after each document is separated from its row, said indicia providing an indication as to which group of documents a document belongs;

collecting means through which said documents are transported after separations from their rows, said collecting means further comprising:

an intermediate collecting stage through which all documents pass and wherein a document is temporarily retained if said document is not associated with a preceding group of documents; and,

a final collecting stage for collecting documents belonging to said preceding group of documents;



means for determining when all documents in said preceding group of documents have passed from said intermediate collecting stage to said final collecting stage;

means for communicating to said intermediate collecting stage that all documents in said preceding group of documents have passed from said intermediate collecting stage and that said intermediate collecting stage may temporarily retain therein a subsequent document;

means for discharging from said final collecting stage said preceding group of documents; and,

means for communicating to said intermediate collecting stage the discharge of documents from said final collecting stage and for enabling said intermediate collecting stage to release any subsequent document temporarily retained therein.

4,456,128

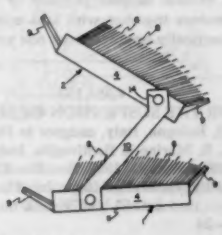
STACKED TRAY FOR SLOTTED CARDS

Irwin Warshaw, Clover Rd., Mohegan Lake, N.Y. 10547

Filed Jul. 30, 1982, Ser. No. 404,342

Int. Cl.³ B42F *17/00*

U.S. Cl. 211—11 **9 Claims**



1. An apparatus for holding slotted cards which comprises:

(a) a first tray having a floor and side walls with track means on its floor for holding the cards having slot means adapted to be detachably but moveably held in the track means;

(b) a second tray, also having track means on its floor for holding the cards, said second tray being spaced above the first tray; and

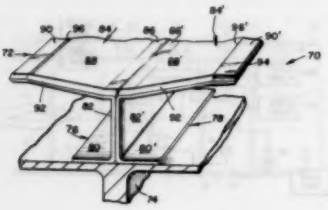
(c) a support fixedly attached at one end to a side wall of the first tray and pivotally attached at its other end to a side wall of the second tray to allow for pivotal movement of the second tray from a first lowered position substantially parallel to the first tray to a second raised position angular to the first tray.

4,456,129

LOAD SUPPORT FLANGES WITH COINED EDGES

R. Richard Baber, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Jul. 15, 1981, Ser. No. 283,725
Int. Cl.³ A47F 7/00
U.S. Cl. 211—13 **11 Claims**



1. A load support device for supporting flat and round packages of textile products to prevent undesirable creasing or damage to the outer surface of the textile product, said device comprising a support pad having two diametrically opposed support flanges each having an outer flat portion, an inner flat portion spaced vertically below the outer flat portion and an angled portion connecting the outer and inner flat portion together, and support means for supporting said support pad wherein the outer peripheral edges of said support pad include means defining beveled edge portions for substantially preventing creasing of said textile product supported upon said support pad and for increasing the load bearing strength of said support pad, said beveled edge portions being beveled at an angle ranging from about 5 degrees to about 25 degrees wherein said support pad is comprised of two seperate generally U-shaped members each having a foot portion, a vertical support portion having upper and lower areas and an upper support flange portion with each of said upper support flange and foot portions extending outwardly in the same direction, respectively, from said upper and lower areas of said vertical support portion, so that said support pad is formed by securing each of said vertical support portions of said two separate U-shaped members together with said upper support flange portions diametrically opposed from one another.

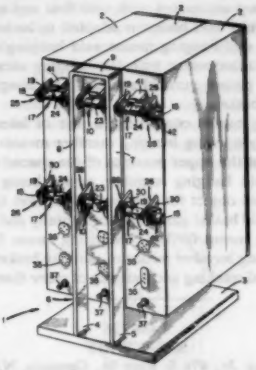
4,456,130

SYSTEM FOR THE SUSPENSION OF MODULAR UNITS

Mario Possati, Bologna, Italy, assignor to Finike Italiana Marposs S.p.A., S. Marino di Bentivoglio, Italy

Filed Apr. 21, 1982, Ser. No. 370,391
Claims priority, application Italy, Jul. 17, 1981, 3482 A/81
Int. Cl.³ A47F 7/00
U.S. Cl. 211—26 **18 Claims**

1. A suspension system for an electric gauge of the modular type comprising at least one module, a support device for sustaining at least one module and coupling means for coupling the module to the support device, said support device including a base and a member fixed to the base and extending substantially in a vertical direction, said coupling means including support elements fastened to the member and hooking elements fixed to the module for hooking the modules to the support elements, said hooking elements being adapted to be coupled to the support elements and uncoupled from them by pushing the modules substantially in a vertical direction, said



modules having limit stop elements adapted to facilitate the uncoupling of the modules.

4,456,131

REMOTE CONTROLLED LINE LOCKING, SLACK PULLING CABLE LOGGING CARRIAGE

Scott L. Kuehn, Missoula, Mont., assignor to Champion International Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 388,886, Jun. 16, 1982. This application May 9, 1983, Ser. No. 492,743
Int. Cl.³ B66C 21/00; B61H 7/12; E01B 29/22
U.S. Cl. 212—97 **2 Claims**

1. A cable logging carriage comprising:
(a) a frame;
(b) a skyline sheave mounted on said frame for engagement with a skyline whereby said carriage can traverse the skyline;
(c) a brake pad disposed adjacent to said skyline sheave;
(d) a skidding line sheave mounted on said frame and spaced apart from said skyline sheave, said skidding line sheave being operable to engage a skidding line which is adapted to be attached to cut logs;
(e) a single hydraulic cylinder mounted on said frame and interposed between said skyline and skidding sheaves;
(f) a first ram member movably mounted on said cylinder and extending from one end thereof toward said skyline sheave, said first ram member being movable between an extended position and a retracted position;
(g) a first brake shoe mounted on a distal end of said first ram member and operable with said brake pad to grip the skyline when said first ram member is in said extended

position to lock said carriage in a fixed position on the skyline;

(h) a second ram member movably mounted on said cylinder and extending from the other end thereof toward said skidding line sheave, said second ram member being movable between an extended position and a retracted position.

(i) a second brake shoe mounted on a distal end of said second ram member and operable to grip the skidding line against said skidding line sheave when said second ram member is in said extended position to lock the skidding line to said carriage; and

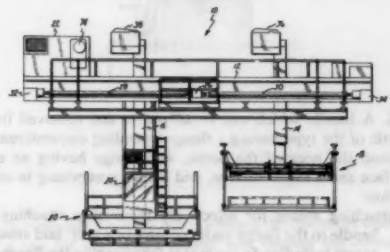
(j) means for selectively supplying hydraulic fluid to said hydraulic cylinder to selectively move said first ram member to its extended position while concurrently moving said second ram member to its retracted position and visa versa.

4,456,132

CONTROL SYSTEM FOR AUTOMATIC MATERIAL HANDLING CRANE

Dean R. LaValle, Hugo, and Philip A. McLain, Isanti, both of Minn., assignors to PaR Systems Corp., St. Paul, Minn.

Filed Dec. 8, 1980, Ser. No. 214,190
Int. Cl.³ B66C *17/00*
U.S. Cl. 212—160 **12 Claims**



1. A system for performing material handling at a plurality of stations, the system comprising:

movable means movable to each of the plurality of stations;

a material handling mechanism carried by the movable means;

drive means for moving the movable means;

actuator means for operating the material handling mechanism;

means for providing signals indicative of the position of the movable means;

means for providing signals indicative of operating status of the material handling mechanism;

manual control means carried by the movable means for providing manual control signals;

remote control means, positioned at a remote location with respect to the movable means, for providing remote control signals based on a stored schedule and status information relating to the movable means and the material handling mechanism the remote control means comprising:

station location storage means for storing a first set of data representative of a location for each station;

service step storage means for storing a second set of data representative of a sequence of individual operating steps of the movable means and the material handling mechanism for each of a plurality of different types of material handling service which can be performed by the movable means and the material handling mechanism at the station;

operator controlled schedule creating means for producing first, second and third operator input signals to create a third set of data representing the schedule the operator controlled schedule creating means comprising:

first operator input means for providing a first operator input signal which identifies a series which is included in the schedule, wherein the series denotes a plurality of stations at which the same type of material handling service is to be performed;

second operator input means for providing a second operator input signal which identifies which of the stations represented by the first set of data are included in the identified series; and

third operator input means for providing a third operator input signal which identifies which of the plurality of different types of service represented by the second set of data is to be performed at the identified stations of the identified series;

schedule storage means for storing the third set of data representing the schedule based upon the first, second and third operator input signals; and

remote control signal producing means for producing the remote control signals which represent each step of operation of the drive means and the actuator means during the schedule based upon the first, second and third sets of data and the status information;

selection means for selecting control signals from among manual control signals and the remote control signals;

control means carried by the movable means for providing control signals to the drive means and the actuator means as a function of the selected control signals, and for providing the status information as a function of the signals indicative of position of the movable means and the signals indicative of operating status of the material handling mechanism; and

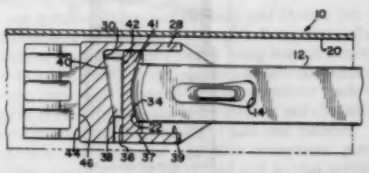
communication link means for transmitting the remote control signals from the remote control means to the control means carried by the movable means, and for transmitting the status information from the control means to the remote control means.

4,456,133

SLACKLESS RAILWAY COUPLER CONNECTION

Russell G. Altherr, Munster, Ind., and John W. Kaim, Chicago, Ill., assignors to AMSTED Industries Incorporated, Chicago, Ill.

Filed Mar. 24, 1982, Ser. No. 361,399
Int. Cl.³ B61G *1/32, 5/00, 7/00, 9/20*
U.S. Cl. 213—62 R **2 Claims**



1. A railway drawbar coupler arrangement comprising a drawbar, said drawbar comprising an elongated shank portion and a vertically and horizontally convex butt surface at an end thereof,

said drawbar further having near one end thereof a slot extending horizontally through the shank portion, said slot having an upper surface and lower surface each having a forward portion of which diverges away from the longitudinal centerline of the drawbar, a bar shaped key extending horizontally through said slot, and a bearing block between said key and the rear inner concave surface of the drawbar slot,

a follower block having a vertically and horizontally con-

cave front surface abutting the convex butt end of the drawbar and a generally flat rear surface,

a wedge shaped shim, and a generally rectangular pocket having two side walls, a bottom wall, a top wall and a generally flat interior rear surface, the flat surfaces of the follower block and of the pocket diverging upwardly, said follower block having a bottom surface resting on the bottom wall of said pocket to keep the concave front surface of the follower block vertically symmetrical with the drawbar slot,

said wedge shaped shim fitting between the flat interior rear surface of the pocket and the flat rear surface of the follower block such that by the gravity induced downward force of said shim, said drawbar butt end maintains butted contact with the front surface of the follower block, and the bearing block maintains contact with the inner concave surface of the drawbar slot and the key.

2. A railway drawbar coupler arrangement comprising a drawbar having an elongated shank portion and a convex butt end, said convex butt end having a generally flat, forwardly diverging rear wall, a yoke having a concave internal rear section, concave lower and upper forward sections and a concave internal bottom section, a follower block having a convex rear wall and a generally flat diverging front wall, and a wedge shaped shim,

the convex butt end of the drawbar abutting against the concave internal bottom section of the yoke,

the convex rear wall of the follower block abutting against the concave internal rear section of the yoke,

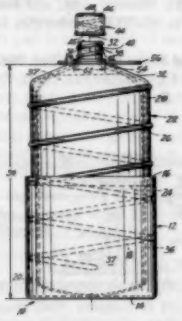
and the wedge shaped shim fitting between the front wall of the follower block and the rear wall of the butt end of the drawbar such that by the gravity induced downward force of said shim, said drawbar maintains butted contact with the forward section of said yoke.

4,456,134

APPARATUS FOR CONTAINMENT OF CARBONATED BEVERAGES

Leonard Cooper, 999 Grant Ave., Pelham Manor, N.Y. 10803

Filed Jan. 22, 1982, Ser. No. 341,844
Int. Cl.³ B65D *21/08*
U.S. Cl. 215—12 R **19 Claims**



1. A container for storing material therein and having an opening adapted for filling and pouring said material contents, said material including volatile components generating a gas pressure in the portion of said container not filled with said material, said internal pressure exceeding the external ambient pressure, comprising:

a first portion, a second portion, and a third collapsible portion positioned between said first and second portions and joined thereto to form an enclosure for said stored material;

adjustable means for incrementally collapsing said collapsible portion, the internal volume of said container being varied for each incremental adjustment, and for maintaining said container at each condition of adjusted internal volume, the volume of said container being subject to reduction incrementally for storage of said container after portions of said contents are discharged from said opening; and

means for sealing said opening against the escape of said internal gas under pressure to said ambient.

4,456,135

HANDLE AND RESEAL FOR FLANGED BOTTLE

Huibertus A. Beekes, 433 Stagecoach Rd., Arroyo Grande, Calif. 93420

Filed Dec. 21, 1981, Ser. No. 332,941
Int. Cl.³ B65D *23/12*
U.S. Cl. 215—100 A **26 Claims**

1. A handle which can be affixed to and removed from a bottle of the type having a flange extending circumferentially around the neck of the bottle, said flange having an upper surface and a lower surface, said handle comprising in combination:

attaching means for selectively removably attaching said handle to the flange under control of a user, said attaching means including finger means for engaging the flange, said finger means positioned to extend under the flange adjacent the lower surface of the flange when said handle has been affixed to the bottle; and,

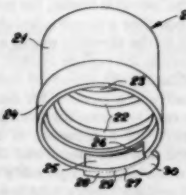
grip means connected to said attaching means and having an elongated shape conducive to being grasped by the user for manipulating the bottle.

4,456,136

SAFETY CLOSURE

Johannes S. Pálsson, Enghave Plads 13, 1670 Copenhagen V, Denmark

Filed Jun. 21, 1983, Ser. No. 506,321
Claims priority, application Denmark, Jul. 1, 1982, 2961/82
Int. Cl.³ B65D *55/02*
U.S. Cl. 215—216 **7 Claims**



1. A safety closure for a container serving as a receptacle for sensitive products, e.g. medicine, said closure comprising a closure cap and a container neck part, said closure cap being applied on and removed from the container neck part by rota-

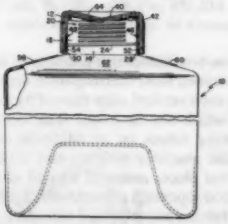
tion, said container neck part having an elastically resilient blocking means which a stop face on the closure cap encounters upon rotation of the closure cap in the direction of removal from the closing position when the blocking means is in an unaffected position, said closure cap having an elastically resilient part through which the blocking means can be actuated to cancel the blocking by extenal pressure on the part in question, characterized in that the blocking means is an elastic, flexible strip which extends along a portion of the periphery of the neck member and at some distance from the neck member and is attached to or connected with the neck member at the ends, and which is formed with a blocking face spaced somewhat from the ends and intended for cooperation with the stop face of the closure cap.

4,456,137

VENTING ARRANGEMENT FOR COVERED CONTAINERS

George Lyman, Kennebunkport, Me., assignor to Data Packaging Corporation, Cambridge, Mass.

Filed Jul. 19, 1982, Ser. No. 399,907
Int. Cl.³ B65D *41/04*
U.S. Cl. 215—230 **8 Claims**



1. A container having a neck defining the container opening and a cap for alternately sealing and venting the container through the opening, said neck and cap each having interrupted threads which mate with one another to permit the cap to be seated on the neck with the interruption of the threads on the cap aligned with the threads on the neck and the interruptions on the neck aligned with the threads on the cap, said threads when mated permitting the cap to be tightened on the neck to seal the container,

a stop means on the cap and container limiting the extent to which the cap may enclose the neck with the threads on the cap and neck disengaged to ensure the formation of a vent passage between the cap and neck,

and detent means on the cap and container for releasably retaining the cap in the venting position on the neck.

4,456,138

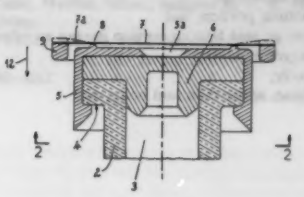
CLOSURE HAVING GRIPPING RING MEANS FOR OPENING

Claude A. Berezlat, Thil, France, assignor to Manufacture Lyonnaise de Bouchage, Lyons, France

Filed Jun. 30, 1983, Ser. No. 510,236
Claims priority, application France, Jul. 1, 1982, 82 11959
Int. Cl.³ B65D *41/14, 41/20, 41/30*
U.S. Cl. 215—232 **8 Claims**

1. Means for sealing a container of the type comprising a cover of aluminum sheet or the like, fastened by gluing or heat-sealing on the surrounding part of the mouth of the container, characterized in that

said cover projects radially beyond the surrounding part of the container mouth to which it is fastened, said projecting part being secured about its entire periphery to a gripping ring, said gripping ring being engaged, at least partially, on the surrounding part of the mouth of the



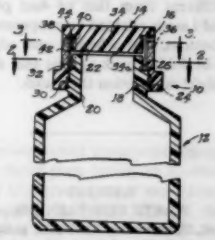
container, and said cover being tearable off the container mouth surrounding part.

4,456,139

VISIBLE TAMPER-PROOF CLOSURE ARRANGEMENT

Henry R. Kent, San Diego, Calif., assignor to Maxwell Laboratories, Inc., San Diego, Calif.

Filed Nov. 2, 1982, Ser. No. 438,605
Int. Cl.³ B65D *41/34*
U.S. Cl. 215—252 **22 Claims**



1. A container and closure cap arrangement comprising;

a container having a neck portion defining an access opening,

a closure cap having a cap end portion and a skirt portion, said closure cap and container neck portion being mutually cooperable to enable releasable mounting of said closure cap on said neck portion, said container neck portion and said closure cap having seal receiving surfaces selectively formed thereon,

and a seal member interposed between said closure cap and said container so as to be inaccessible from externally of said closure cap, said seal member being mutually cooperable with said seal receiving surfaces on said container and closure cap when mounted on said container such that relative movement between said container and closure cap causes irreversible deformation of said seal member,

said closure cap having at least one transparent portion enabling visual observation of said seal so that deformation of said seal may be observed through said closure cap to provide an indication of tampering with said container.

4,456,140

PLUGGING DEVICE FOR A BOTTLE, NOTABLY A SCENT BOTTLE

Reinold Geiger, 38, rue de Longchamp, 92200 Neuilly sur Seine, France

Filed Jul. 9, 1982, Ser. No. 396,821
Claims priority, application France, Jul. 10, 1981, 81 13694
Int. Cl.³ B65D *39/00*
U.S. Cl. 215—364 **27 Claims**

1. A plugging device for a bottle, such as a scent bottle,

wherein said bottle has a neck and an opening in said neck, wherein said device comprises:

(a) a plug including:

(i) a bottom portion; and

(ii) a rib on said bottom portion having an edge; and

(b) a plunger including:

(i) a body;

(ii) a base, wider than said body; and

(iii) a shoulder connecting said body and base, wherein said plunger is adapted to be rigidly connected to said plug bottom and is adapted to mate with said opening in said neck of said bottle, and wherein said plunger is made of a material different from that of said plug bottom, and wherein said base is adapted to cooperate with said rib of said plug bottom, and wherein said edge of said rib is adapted to be folded back against said shoulder, thereby forming a rigid connection therewith.

4,456,141

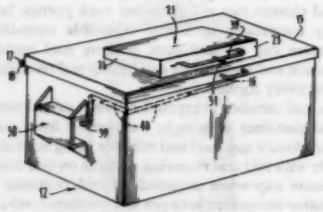
WASTE CONTAINERS

Noel G. Pamment, Strathmore, Australia, assignor to Industrial Containers Pty. Ltd., Car. Moore, Victoria, Australia

Filed Nov. 19, 1981, Ser. No. 323,148

Int. Cl.³ B65D *90/00, 51/18*

U.S. Cl. 220—1 T **14 Claims**



10. In an industrial container having side walls, a bottom wall, means enabling the contents of the container to be emptied by a mechanized refuse vehicle, a main lid part engaged, in the closed position with upper edges of the side walls, the main lid part being hinged to one of the side walls and a second lid part hinged to the main lid part, the improvement comprising said main lid part being constituted by a relatively rigid peripheral frame which carries said second lid part, biasing means biasing said second lid part to an open position relative to said peripheral frame, sealing means comprising a resilient gasket against which the second lid part seals when in the closed position and releasable latching means retaining the second lid part in the closed position and operable to release the second lid part which moves to the open position under the influence of said biasing means.

4,456,142

CONTAINER

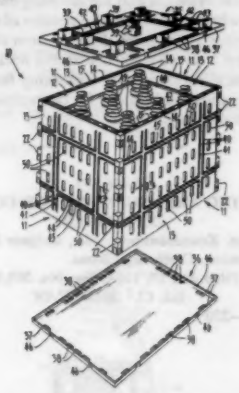
Berkley S. Burling, Warrandyte, Australia, assignor to Acmil Plastic Products Pty. Ltd., Bentleigh, Australia

Filed Dec. 8, 1981, Ser. No. 328,678

Claims priority, application Australia, Dec. 10, 1980, PE6860

Int. Cl.³ B65D *6/10, 6/24*

U.S. Cl. 220—4 F **2 Claims**



1. A cheese-box including a plurality of lightweight sidewall members moulded from thermoplastic material, joined to each other along each vertical edge thereof by integral corner forming means which can be united with corresponding integral corner forming means on an adjoining sidewall member to form a tubular assembly with top and bottom openings; upper and lower end pieces mounted on said assembly to close said top and bottom openings respectively, a follower plate located within said tubular assembly and extending generally in a plane parallel with said upper and lower end pieces; resilient means disposed between said upper end piece and said follower plate and arranged to urge said follower plate to exert pressure on material packaged in said container; each of said sidewall members including a thin imperforate planar section forming one of the interior surfaces of the container and having integral generally vertically directed stiffening ribs extending along the outside thereof; a thin integral outer skin provided on said stiffening ribs defining a series of generally vertically directed flow passages between said thin imperforate planar section and said outer skin; a plurality of access openings provided in said outer skin arranged to allow outside cooling air to enter each of said flow passages; outlet openings provided in said end pieces, said outlet openings being arranged to allow air to flow through said flow passageways and to exit through said outlet openings; said lower end pieces each including a plurality of pillars which are adapted to space apart cheese boxes stacked one atop the other; said upper end pieces including locating means which are adapted to locate the pillars of another cheese box stacked thereon; the cheese box being constructed in such a manner that the sidewall members, upper and lower end pieces, resilient means and follower plate may be readily disassembled without use of tools into individual components after use, in order to allow individual cleaning thereof.

4,456,143

TAMPER RESISTANT FITMENT FOR A CONTAINER

Eugene E. Davis, Ilford, and George W. Burton, London, both of England, assignors to Johnsen & Jorgensen (Plastics) Ltd., England

Filed Jul. 5, 1983, Ser. No. 510,623

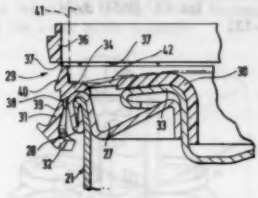
Claims priority, application United Kingdom, May 4, 1983, 8312157

Int. Cl.³ B65D *53/00, 55/02*

U.S. Cl. 220—214 **12 Claims**

1. A tamper-resistant fitment for a container with a conven-

tional cap characterised in that the fitment comprises an outer rim member adapted to seat on the top edge of the container, an inner member to seat on the top of the cap, a plurality of grip tabs projecting from the outer rim member so as to extend downwardly along the outside of the container, a tension belt



to hold the grip tabs in operative position and frangible means connecting the inner member to the outer rim member.

4,456,144

TANK HAVING A FLOATING ROOF AND SEAL

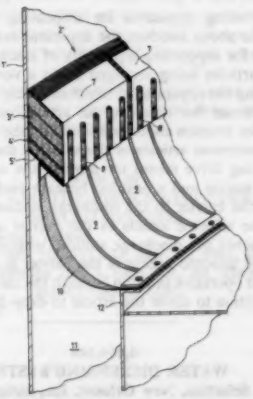
Heinrich Imhof, Offenbach am Main, Fed. Rep. of Germany, assignor to Ingenieurbüro Imhof GmbH, Offenbach am Main, Fed. Rep. of Germany

Filed Jan. 6, 1983, Ser. No. 456,314

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1982, 3202278

Int. Cl.³ B65D *87/20*

U.S. Cl. 220—222 **4 Claims**



1. An arrangement for removal of precipitation from the vertical inner wall of a tank having a floating roof, comprising an annular stripping element which is pressed resiliently against the tank wall above conventional annular gap seals or weather plates, characterized in that said stripping element consists of a layered unit of elastic materials which is constructed in the vertical direction alternately of water absorbing and water permeable layers and of water impermeable layers, wherein the upper and the lower cover consist of water impermeable layers and the entire unit forms in the cross-section a rhomboid so that, when pressed to said tank wall, said individual layers are directed toward said tank wall at an acute angle and each individual layer comes with its end face in full contact with said tank wall, and that, in addition, said stripper unit, combined to a closed ring of individual pieces, is held in short receiving sections and pressed against said tank wall by a plurality of individually acting spring elements, wherein the perpendicular webs of said receiving sections are perforated so that the absorbed water can flow off here.

4,456,145

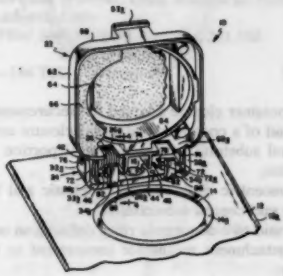
WEATHERPROOF OUTLET COVER

John R. Frank, Weston, Mass., assignor to L. E. Mason Co., Boston, Mass.

Filed Sep. 30, 1982, Ser. No. 430,858

Int. Cl.³ H02G *3/14*

U.S. Cl. 220—242 **9 Claims**



1. A weatherproof outlet cover comprising

A. a stamped metal plate having an aperture therein;

B. a generally U-shaped stamped metal bracket for positioning flush against the plate adjacent the aperture, said bracket having a pair of spaced-apart parallel legs and a bridging section connecting said legs;

C. plural spaced-apart fastening means securing the bracket bridging section to the plate;

D. a molded metal aperture cover, said aperture cover having

1. a shell-like main body shaped and sized to cover the plate aperture; and

2. an extension;

a. projecting laterally from one side of the main body;

b. being slightly narrower than the distance between the bracket legs so that the extension fits between said legs; and

c. defining a pocket that is open at the underside of the aperture cover;

E. coacting hinge means formed at the opposite sides of the aperture cover extension and on said bracket legs for hinging the aperture cover about a hinge axis that permits that cover to be swung between a closed position wherein it lies flush against the plate and covers the aperture therein to an open position wherein it lies more or less perpendicular to the plate exposing said aperture;

F. a coiled wire spring positioned relatively snugly in said pocket so that it is positioned more or less on the hinge axis defined by the hinge means, one end segment of the wire spring engaging and being retained by a wall of the pocket, the opposite end segment of the wire spring projecting from the mouth of the pocket to the bracket bridging section; and

G. means on the bracket bridging section for retaining said spring wire opposite end segment so that when the aperture cover is swung toward its open position, the spring is wound up so that it urges the aperture cover toward its closed position.

4,456,146
COMPOSITE CLOSURE HAVING FRANGIBLE OPENING MEANS

Charles R. Helms, Malvern, Pa., assignor to Container Corporation of America, Chicago, Ill.

Filed Jul. 21, 1983, Ser. No. 515,794
Int. Cl.³ B65D 17/34
U.S. Cl. 220—270 9 Claims

1. A container closure adapted for securement to an upper, opened end of a container body, said closure comprising:

a central substrate having a central portion and an outer portion;

two concentric rings formed of plastic and being molded onto said central substrate;

one of said two concentric rings defining an outer ring having attachment means for securement to the container body;

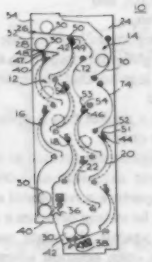
the other of said two concentric rings defining an inner ring serving as a tear strip for removing the central portion of said substrate from the container;

said substrate having a peripheral line of tear lying between said two concentric rings.

4,456,147
AUTOMATIC VENDING MACHINE

Hiroshi Tominaga, Kawasaki, Japan, assignor to Fuji Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 20, 1981, Ser. No. 323,385
Claims priority, application Japan, Nov. 26, 1980, 55/166243
Int. Cl.³ B65G 59/06
U.S. Cl. 221—67 6 Claims



1. A machine for automatically dispensing, goods, including:

a serpentine-shaped vertical storage chamber for said goods, said chamber having an inlet and an outlet;

said serpentine-shaped vertical storage chamber being formed by a series of vertically disposed, individually supported, horizontally-spaced and opposed arcuate track segments and a cooperating pair of side-plates;

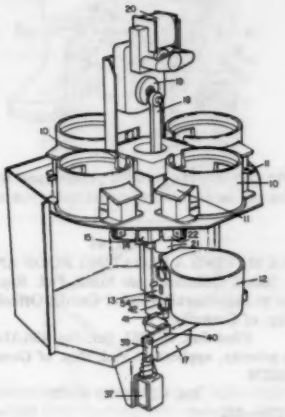
selected ones of said track segments being pivotally supported at their upper ends for rotation when engaged by said goods;

said horizontally-spaced track segments being directly opposed.

4,456,148
MOVABLE SELECTION CARRIER

Alec T. Newman, Nr. Banbury; David Rhodes, Banbury, and Brian A. Edge, Rugby, all of England, assignors to General Foods Limited, Banbury, England

Filed Jan. 28, 1982, Ser. No. 343,685
Int. Cl.³ B65H 3/24
U.S. Cl. 221—132 14 Claims



1. A vending apparatus for dispensing discrete articles stacked one above another, the apparatus comprising stationary means for supporting a plurality of stacks of articles, said stacks of articles being arranged about a vertical axis; means for actuating the apparatus to select an article from a particular stack; a carrier for receiving an article, said carrier being mounted for rotation about said vertical axis; means for releasing the lowermost articles of the selected stack into said carrier, indexing drive means for moving the carrier between a discharge station and a position beneath each stack and then returning the carrier to the discharge station; and means for holding the selected article in the carrier at least until the carrier reaches the discharge station, wherein the means for holding the selected article in the carrier is an arm movable between an operative position beneath the carrier and an inoperative position to allow the article to drop from the carrier.

4,456,149
WATER DISPENSING SYSTEM

George J. Sciortino, New Orleans, La., assignor to Venturon Corporation, Inc., Lafayette, La.

Filed Oct. 21, 1981, Ser. No. 313,300
Int. Cl.³ B67D 5/08
U.S. Cl. 222—1 5 Claims

1. A portable water dispensing system, utilizing a water bottle in an upright position and at a distance from a dispensing port, which comprises:

a. a lightweight housing means placed between said water bottle and said dispensing port;

b. a pump means and a power means to drive said pump means mounted within said housing means;

c. a first fluid line passing through an aperture in said housing means connecting an inlet port of said pump means to at least one water bottle in an upright position for transferring water through said fluid line upon activation of said pump;

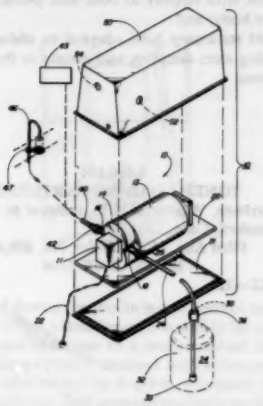
d. a second fluid line extending from an outlet port in said pump means through a second aperture in said housing means to the dispensing port for transferring water through said second fluid line into said dispensing port;

e. control means for automatically activating and deactivat-

ing said pump means mounted within said housing means, said control means comprising:

i. pressure switch means for automatically activating said pump means responsive to the drop of pressure in said second fluid line;

ii. thermal overload means for de-activating of said pump means when said pump means becomes overheated when the water bottle is empty;



iii. time delay means for de-activating of said pump means after a predetermined period of time so as to limit the maximum amount of water being pumped during a single demand activation of the pump means further comprising:

a. lockout means requiring manual reset for further pump operation when the time delay means have deactivated said pump.

4,456,150

TUBE'S CAP AND THE PIERCE STRUCTURE OF A SEALED OPENING

Wei-Lu Yang, Taipei, Taiwan

Continuation of Ser. No. 247,633, Mar. 25, 1981, abandoned. This application Jun. 1, 1983, Ser. No. 498,688

Int. Cl.³ B67B *7/26*

U.S. Cl. 222—83 **1 Claim**

1. A dispensing cap for use on a tube of adhesive wherein said cap has a central hole for passage of adhesive, a piercing and cutting means in the form of a double knife depending from and substantially surrounding the inner end of said central hole, the inside surface of said cap being threaded to correspond with the threads provided on the exterior surface of the neck for said tube, a protecting ring maintaining said cap and associated piercing and cutting means in a spaced relationship with a sealed opening of said tube, and a protective cap for the outer end of said dispensing cap, said protecting ring being connected to said cap by frangible and non-frangible rods and being provided with a gap, said non-frangible rod having a thickness such that rotation of said cap to pierce and cut the sealed opening of said tube breaks said frangible rods and stretches said protecting ring forcing it away from the neck of said tube to a position where, by virtue of the non-frangible rod which connects said ring to said cap, it serves as a support to maintain said cap in an upwardly inclined attitude to avoid spillage of adhesive.

4,456,151

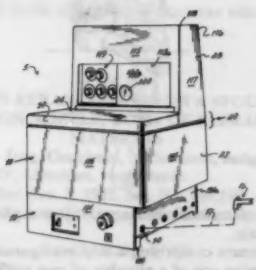
HOUSING FOR APPARATUS FOR MELTING AND DISPENSING THERMOPLASTIC MATERIAL

Richard R. Lewellen, Wooster, Ohio, assignor to Nordson Corporation, Amherst, Ohio

Filed Sep. 14, 1981, Ser. No. 301,518

Int. Cl.³ B67D *5/62*

U.S. Cl. 222—146 HE **20 Claims**



1. An apparatus for melting solid thermoplastic material and for supplying the molten thermoplastic material to a dispenser, said apparatus including

a melter tank, said tank comprising a bottom wall and side walls extending upwardly from said bottom wall, said tank having an open top,

electrical resistance heating means mounted within said bottom wall of said tank,

electrical control means for supplying electrical power to said heating means so as to maintain thermoplastic material contained in said tank at a preset temperature,

a housing encasing said tank and said electrical control means, said housing including a cover over said open top of said melter tank,

a tank lid over the open top of said tank, and

a connector between said tank lid and said housing cover, said connector being a snap-fit connector and including a spring element for retaining said tank lid attached to said housing cover, said spring element being operable to release said tank lid from said housing cover in the event that said tank lid becomes adhered to said tank.

4,456,152

MEASURING AND DISPENSING APPARATUS

Don H. Young, 2215 N. 38th Way, Phoenix, Ariz. 85008, and Austin E. Elmore, 8519 E. Pasadena Ave., Scottsdale, Ariz. 85253

Filed May 3, 1982, Ser. No. 374,072

Int. Cl.³ G01F *11/06*

U.S. Cl. 222—309 **8 Claims**

1. A measuring and dispensing device comprising:

a frame,

a supply receptacle,

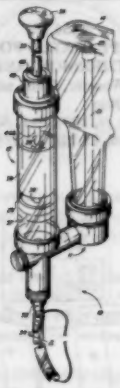
a measuring and dispensing means mounted on said frame,

said measuring and dispensing means comprising a cylinder and a plunger reciprocally operable in said cylinder,

a passageway in said frame interconnecting said receptacle and said cylinder,

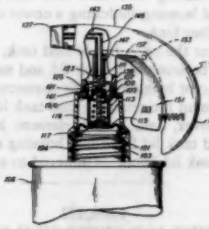
a first check valve in said passageway to arrest flow from said cylinder to said receptacle,

a discharge port in the end of said cylinder,
a discharge nozzle connected to said port,
a check valve located between said discharge port and said nozzle to arrest flow from said nozzle into said cylinder, and
cam means mounted inside of said cylinder for limiting longitudinal movement of said plunger for controlling the



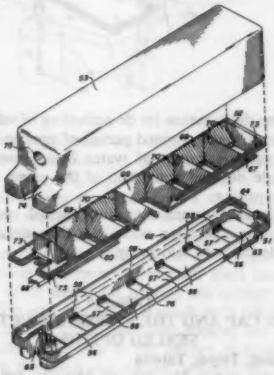
amount of material discharged by said plunger through said nozzle,
said cam means comprising a step configuration with each step forming one of a plurality of cam surfaces, and
said plunger comprising a piston longitudinally movable within a measuring cylinder mounted within said cylinder for engaging with said cam surfaces.

4,456,153
TRIGGER ATTACHMENT FOR PUMPS
Philip Meshberg, 2500 S. Ocean Blvd., Palm Beach, Fla. 33480
Filed Oct. 13, 1981, Ser. No. 312,260
Int. Cl.³ B65D *83/14*; B67D *5/42*
U.S. Cl. 222—321 **5 Claims**



1. A trigger attachment for a finger operated pump having a pump body and an axially outwardly projecting actuating and dispensing stem having therein an axial outlet bore through which material is dispensed upon axial inward movement of said stem, said pump body adapted to be mounted to a container, comprising:
a. a trigger body including:
i. a partially vertically extending pistol grip;
ii. a horizontal portion extending from said pistol grip terminating in a hollow cylindrical portion;
iii. a hollow cylindrical vertical portion extending downwardly from said horizontal portion and rigidly coupling said trigger body to said pump body;
b. a trigger mechanism comprising an essentially right angular member having first and second arms, said first arm terminating in means engaging said stem and the second arm spaced from said vertically extending pistol grip, hinged to said trigger body, said trigger mechanism adapted to convert a radial motion of said trigger mechanism with respect to said trigger body into axial inward motion at said actuating stem;
c. a nozzle mounted to said hollow cylindrical horizontal portion of said trigger body such as to remain in a fixed position with respect to both said pump body and said trigger body; and
d. a rigid stationary tube adapted to slidingly mate with actuating stem coupling said nozzle to the outlet bore in said stem.

4,456,154
TONER LOADING CARTRIDGE
Leland Herriman, Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 16, 1982, Ser. No. 408,407
Int. Cl.³ B65B *1/06*
U.S. Cl. 222—325 **11 Claims**

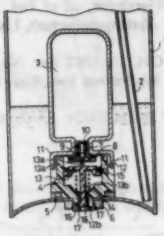


1. A toner cartridge for replenishing toner in a toner dispenser comprising a base plate and a toner hopper positioned on top of and slidably engaged with said base plate, said base plate having at least one aperture in the bottom through which toner may pass and having a hook at a front end adapted to lock under the lip of a toner dispenser opening when said toner cartridge is placed therein, said toner hopper having at least one aperture in the bottom through which toner may pass and having a hook at the end opposite the front end of the base plate adapted to lock under the lip of opposite the toner dispenser opening of the base plate, said at least one aperture in said base plate and said toner hopper not being in communicating alignment when in a closed position and, said base plate providing a seal under said at least one opening in said closed position;
means to slidably move said toner hopper relative to said base plate to an opened positioned wherein said hook an said toner hopper locks under the opposite lip of the toner dispenser opening and said at least one aperture in said toner hopper is in communicating alignment so that toner may pass from said toner hopper through said base plate to the toner dispenser whereby said toner cartridge dispenses toner only when in the locked position and said toner cartridge is removable from said toner dispenser only when said toner hopper and said base plate are in the closed position.

4,456,155
AEROSOL SPRAY DEVICE

Hiroyasu Miyata; Masao Ohkita; Akinori Itoh, all of Furukawa, and Shohji Minatodani, Zama, all of Japan, assignors to Alps Electric Co., Ltd., Tokyo, Japan

Filed Oct. 13, 1981, Ser. No. 311,062
Claims priority, application Japan, Oct. 14, 1980, 55-143430
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—396 6 Claims



1. In an aerosol device for producing an aerosol spray of an agent contained within a container; an assembly for raising the pressure within said container to a predetermined level; said assembly including a cylinder charged with a compressed gas and having an outlet closed by a valve, a pressure regulator attached to said cylinder, said pressure regulator having means including a piston movable in response to lowering of the pressure within said container for opening said valve to release compressed gas from said cylinder to raise the pressure back to said predetermined level, means for mounting said assembly in fluid-tight relation over an opening in a wall portion of said container; and de-activating means secured to said piston for holding it in a position to maintain said valve in a state closing said outlet of said cylinder until the pressure within said container is to be raised to said predetermined level, said de-activating means including a piston rod connected to said piston and adapted to extend through said opening, said piston rod and said opening having axial projections and axial grooves formed respectively thereon so that said piston rod may be rotated to bring said projections out of alignment with said grooves to hold it in said position maintaining said valve in its state closing said outlet and further rotated to bring said projections into alignment with said grooves to allow said piston to move according to the level of pressure within said container.

4,456,156
UNLOADING APPARATUS FOR SILO

Palle N. G. Westerby, Hjortekaesvej 115, DK 2800 Lyngby, Denmark

Filed May 18, 1981, Ser. No. 264,850
Claims priority, application Denmark, Apr. 9, 1980, 3763/80
Int. Cl.³ G01F *11/20*
U.S. Cl. 222—415 10 Claims

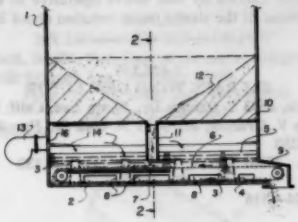
1. Device for unloading a silo having at least one side wall and a floor, for containing pulverous or granular material supported on the silo floor and by the at least one silo side wall, comprising:

a central material chute disposed centrally in the silo and arranged above the silo floor and inwardly spaced from the silo side wall for permitting the supporting of the material on the silo floor and by the silo side wall,

a conveyor box disposed below the chute and above the silo floor for receiving material from the chute,

a conveyor in the conveyor box and above the silo floor for conveying material from the chute to a material outlet in the silo, and

a cover member above the box and covering the box except for the chute, whereby the conveyor is activated to convey material out of the silo through the central chute so that substantially even forces are exerted by a remainder

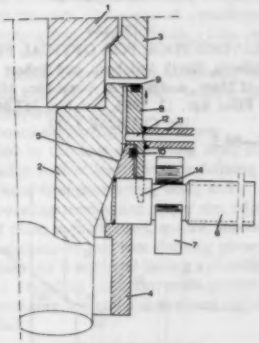


of material in the silo on the at least one side wall of the silo.

4,456,157
CONNECTION ARRANGEMENT FOR A SPOUT AND AN IMMERSION NOZZLE, BOTH OF REFRACTORY MATERIAL

Wybrand A. de Jong, Castricum, Netherlands, assignor to Estel Hoogovens BV, IJmuiden, Netherlands

Filed Jun. 3, 1982, Ser. No. 384,199
Claims priority, application Netherlands, Jun. 5, 1981, 8102725
Int. Cl.³ B22D *41/00*
U.S. Cl. 222—591 6 Claims



6. A nozzle assembly for liquid metal comprising

a spout having a downwardly opening discharge mouth, formed of refractory material,

an immersion nozzle of refractory material detachably mounted to said spout for flow of liquid metal from said mouth of said spout into the nozzle,

a first metal support ring surrounding and supporting the spout and having a downward facing end surface,

a second metal support ring surrounding and carrying the nozzle and having laterally projecting arms which, in use, are lifted to bring the nozzle into its mounted position

a sealing sleeve having an axis mounted on the said second support ring so as to be movable upwardly and downwardly thereon in its axial direction while making sealing contact therewith, and having an upper end which, on upward movement of the sleeve engages the said downward facing end surface of the first metal support ring to form a seal therewith, the sleeve thereby sealing the connection of the spout and the nozzle from the outside atmosphere, there being an annular gap between the sleeve and

the nozzle, and the sleeve also being rotatable about its axis on the second support ring with

connection means for the supply of an inert gas into said annular gap, and

cam means carried by said sleeve operative to effect axial movement of the sleeve on its rotation about its axis.

4,456,158

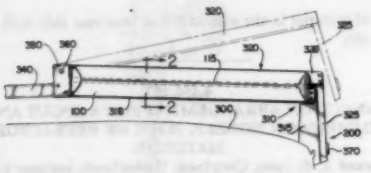
SKI RACK WIND DEFLECTOR

Keith Wertz, 2533 S. Deegan Dr., Santa Ana, Calif. 92704, and Emmette V. Graham, Jr., 9101 N. 60th St., Paradise Valley, Ariz. 85253

Filed Mar. 4, 1983, Ser. No. 472,132

Int. Cl.³ B60R *9/12*

U.S. Cl. 224—316 **7 Claims**



1. A removable wind deflector adapted for use with a scissors-type ski rack having clamp members for clamping skis when in a clamping position, comprising an aerodynamically shaped deflector surface coupled to a locking member adapted to be held by clamp members of the ski rack when in such clamping position.

4,456,159

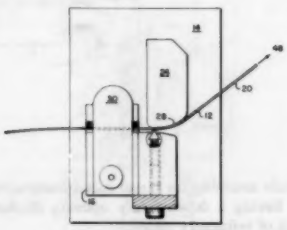
CLEAVING TOOL FOR OPTICAL FIBERS

Harold A. Roberts, North Attleboro, and Robert A. Wey, Plainville, both of Mass., assignors to Augat Inc., Mansfield, Mass.

Filed Apr. 12, 1982, Ser. No. 367,460

Int. Cl.³ B26F *3/00*

U.S. Cl. 225—96.5 **12 Claims**



1. A cleaving tool for separating an optical fiber comprising:

a base;

an optical fiber retaining block mounted on said base and having a groove adapted to receive an optical fiber, said block having an end with which said groove communicates;

stationary scribe means mounted on said base and positioned adjacent said end to one side of the centerline of said groove; and

stationary outwardly curved anvil means mounted on said base and positioned to the other side of said centerline opposite said scribe means and spaced therefrom, said anvil means being curved outwardly towards said stationary scribe means, whereby an optical fiber positioned in said groove and extending between said scribe and anvil means may be cleaved by moving said fiber first into contact with said scribe means and secondly into contact with said curved anvil means.

4,456,160

GUIDE DEVICE FOR A RECORDING MEDIUM IN TAPE FORM, ESPECIALLY A MAGNETIC TAPE

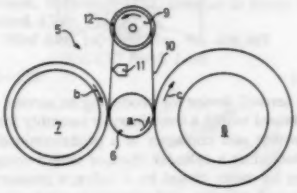
Klaus Schoettle, Heidelberg; Andreas Ilmer, Ludwigshafen, and Joachim Flohr, Viernheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 16, 1981, Ser. No. 312,320

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1980, 8028597[U]

Int. Cl.³ B65H *23/24, 23/08;* G03B *1/04*

U.S. Cl. 226—195 **8 Claims**



1. A guide device for a recording medium in tape form, especially a magnetic tape, which is subjected to sharp acceleration in the lengthwise direction, comprising at least one guide roll rotatably mounted in bearing means, around which guide roll the transported recording medium is guided; and a means for applying a braking torque between the roll and the bearing means, said means for applying a braking torque providing a braking torque of a magnitude sufficient to keep said guide roll from rotating while the tape is transported, during normal operation, at a relatively high speed, wherein said guide roll and said means for providing a braking torque permit a boundary layer of air to be created between the transported tape and the guide roll, which eliminates all direct contact therebetween, but is of a magnitude insufficient to prohibit the tape from taking the guide roll along substantially without slippage at times when the tape is travelling at a relatively low speed.

4,456,161

METHOD AND APPARATUS FOR DISPENSING FASTENERS

David B. Russell, Southborough, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Division of Ser. No. 071,458, Aug. 31, 1979, Pat. No. 4,288,017. This application Aug. 27, 1981, Ser. No. 296,700

Int. Cl.³ A41H *37/00*

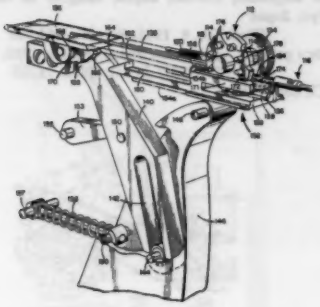
U.S. Cl. 227—67 **9 Claims**

1. Apparatus for dispensing a fastener through a slotted hollow needle, form stock formed by a plurality of fasteners, each having a filament with an angularly disposed bar at one end, comprising

means, including a trigger, for advancing the fastener to the rear of the needle and forcing the end bar through the bore of the needle with its associated filament projecting through the slot of the needle;

said trigger being mounted so that the compression force required to operate the trigger decreases as the trigger is depressed, by being directly secured to a movable pivot of a support rod for a coiled compression spring; and

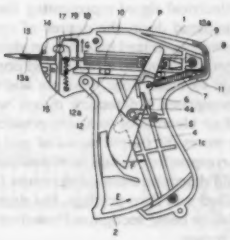
said support rod being secured to a fixed pivot within said apparatus and being mounted in an opening of said movable pivot to be movable through said opening in accordance with the extent to which said trigger is depressed.



4,456,162
TAG ATTACHER

Akira Furutsu, Tokyo, Japan, assignor to Ben Clements & Sons, Inc., South Hackensack, N.J. and Japan Bano'k Co., Ltd., Tokyo, Japan

Filed Dec. 9, 1981, Ser. No. 329,086
Claims priority, application Japan, Dec. 16, 1980, 55-177574
Int. Cl.³ B26C *5/06*
U.S. Cl. 227—67 **9 Claims**

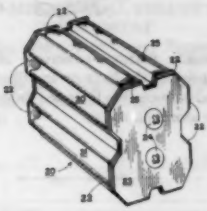


1. A tag attacher for attaching tag pins which are connected together in spaced relation along a connecting bar as a tag pin assembly, comprising a tag attacher body; lever means pivotably supported on said tag attacher body for displacement between first and second positions; a hollow needle having a rear end supported on a said tag attacher body and a front end projecting from said tag attacher body, said attacher body being formed with a guide bore aligned with said rear end of said hollow needle and adapted to guide said connecting bar of said tag pin assembly; tag pin ejector means coupled to said lever means for displacing the tag pin in registration with said hollow needle, in response to the displacement of said lever means from its first to its second position, so as to eject said tag pin at least in part through said hollow needle while separating said tag pin from said connecting bar; a cam member mounted for displacement adjacent said guide bore; a cam driving member loosely coupled to said lever means for displacement thereby during at least a portion of the displacement of said lever means and positioned for engagement with said cam member for displacement of said cam member; a locking member pivotably mounted on said cam member and having at least a pair of projections positioned in said guide bore in registration with the path of the connecting bar of the tag pin assembly between which the connecting bar is held; and spring means coupled between said locking member and said tag attacher body so that said projections forcefully engage said connecting bar during the displacement of said cam member in one direction for displacing said connecting bar in said guide bore to position the next tag pin in registration with said hollow needle.

4,456,163
MULTI-FACED SOLDER POT

Hubert Zach, Berlin, Fed. Rep. of Germany, assignor to Micro Electronic Systems Inc., Danbury, Conn.

Filed Oct. 23, 1981, Ser. No. 314,420
Int. Cl.³ B23K *3/00*
U.S. Cl. 228—56 **9 Claims**



1. A solder pot for removing and replacing multi-pinned components mounted on printed circuit boards, said solder pot comprising:

A. a heat conducting head having a plurality of faces formed in its outer peripheral surface, with each of said faces having at least one elongated, longitudinally extending solder retaining recess formed therein with said recess having an overall length providing cooperative engagement with the ends of the pins of a multi-pinned component extending from the underside of the printed circuit board;

B. heating means cooperatively associated with the heat conducting head for controllably heating the head to any desired temperature; and

C. circuit board-supporting spacer means

a. mounted to the heat conducting head in cooperating association with at least one face-defining plane of said multi-faced heat conducting head, and

b. incorporating terminating upper rim edges defining a second plane in juxtaposed, spaced, substantially parallel relationship to said face-defining plane,

whereby a solder pot is achieved having a plurality of faces for removing and replacing different multi-pinned components while also preventing contact of the printed circuit board with the heated head.

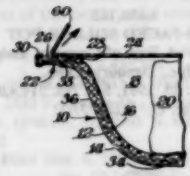
4,456,164
DELIDDABLE OVENABLE CONTAINER

Peter D. Foster, Waterville, and Clifford Stowers, Fairfield, both of Me., assignors to Keyes Fibre Company, Waterville, Me.

Filed May 18, 1982, Ser. No. 379,359
Int. Cl.³ B65D *5/64;* **A21D** *10/02*
U.S. Cl. 229—43 **13 Claims**

1. A liddable packaging container comprising a relatively thick base of fibrous material having bonded to at least one portion of one side thereof a relatively thin liner of polymeric material, the base and the liner and the bond between them being capable of withstanding temperatures ranging from below freezing up to as high as about 400° F., the container including a central portion for accommodating a product to be packaged therein surrounded by a marginal portion for accommodating a lid to contain the product, the marginal portion including a surface to which a lid can be sealed to the liner, the lid and the seal between the lid and the liner also being capable

of withstanding temperatures within the aforesaid range, and a coating of release material on the marginal portion outside the area where the lid is to be sealed to insure that the seal can be overcome and the lid fully separated from the liner of the



container manually without adversely affecting either the polymeric material of the liner or the fibrous material of the base or the bond between the liner and the base at any temperature within the aforesaid range.

4,456,165

BREAK-AWAY SECURITY MEANS FOR SELF-LOCKING COVERED COIN RECEPTACLE

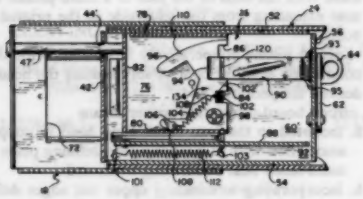
August M. Sciortino, 1838 Weeg Way, Park Ridge, Ill. 60068

Filed Nov. 12, 1981, Ser. No. 320,171

The portion of the term of this patent subsequent to Feb. 8, 2000, has been disclaimed.

Int. Cl.³ G07B *15/00*; G05B *63/00*

U.S. Cl. 232—15 **13 Claims**



1. For use in a self-locking cover assembly for a coin receptacle mountable within a channeled bracket which is secured in communication with a coin delivery chute of a coin operated machine, the self-locking cover assembly including first and second channeled members telescopically engaged, the first channeled member having a window alignable with the delivery chute and a latch assembly, said first channeled member having a slide seated for slidable movement within the cover for selectively covering and uncovering the window, a first spring operable within the cover to bias the slide in window covering condition and a second spring operably seated within the cover assembly and having a blocking portion in bearing relation to said slide selectively to block movement of the slide whereby to prevent uncovering of the window when the covered receptacle is withdrawn from the channeled bracket, the invention comprising said second spring having a weakened portion capable of severance from said second spring upon exercise of sufficient force applied to the blocking portion of said second spring from the exterior of the cover assembly when unauthorized force is applied to the second spring in the course of gaining surreptitious entry to the interior of the coin receptacle during an attempt to lift the blocking portion from blocking condition, the severance resulting in formation of a severed section from said second spring.

4,456,166

TEMPERATURE CONTROL SYSTEM FOR AIR CONDITIONERS

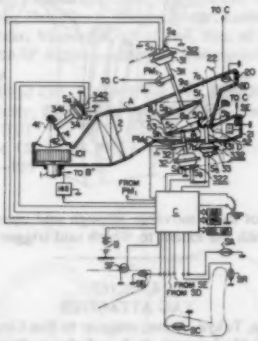
Tsuneo Kagohata, Ibaraki, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 8, 1983, Ser. No. 464,946

Claims priority, application Japan, Feb. 8, 1982, 57-17552

Int. Cl.³ G05D *23/00*; G05B *13/00*

U.S. Cl. 236—13 **6 Claims**



1. A temperature control system for an air conditioner having an air blend door which is controlled by an electrical signal related to a room temperature such that the amount of cool air to be reheated by a heater and the amount of cool air bypassing the heater have an appropriate proportion so as to bring the room temperature to a desired temperature, and a sensor which provides an electrical signal representing the degree of opening of said air blend door, the degree of opening of said air blend door being recognized based on an electrical signal from said sensor corresponding to a full-closed position or full-open position of said air blend door, wherein said temperature control system comprises a detection means which detects the arrival of said air blend door to a zero-position, and a memory means which stores the output signal of said sensor as a reference value corresponding to said zero-position of said air blend door when said detection means determines that said air blend door has reached said zero-position, the degree of opening of said air blend door being recognized based on a value stored in said memory means.

4,456,167

THERMOSTATICALLY CONTROLLED VALVE IN THE CIRCULATION OF LIQUID COOLED INTERNAL COMBUSTION ENGINES

Hermann Büeter, Stuttgart, Fed. Rep. of Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 23, 1982, Ser. No. 422,490

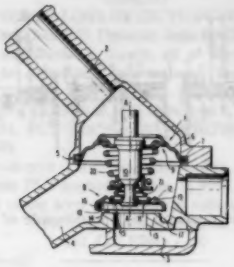
Claims priority, application Fed. Rep. of Germany, Sep. 26, 1981, 3138368

Int. Cl.³ G05D *23/12*

U.S. Cl. 236—345 **5 Claims**

1. A thermostatically controlled valve in the cooling circulation of liquid-cooled internal combustion engines, comprising two substantially coaxially arranged interconnected valve means actuatable by a temperature-dependent working element disposed between the valve means and controlling a radiator return line means and a bypass line means, the valve means controlling the bypass line means having a valve disk arranged at the temperature-dependent working element and being provided with through-flow openings controlled in dependence on temperature for a partial quantity of the cooling medium circumcirculating the working element, the through-flow openings being arranged in said valve disk, the

valve disk having a substantially plane base portion provided with the through-flow openings cooperating with an end face of a connection of the bypass line means forming a valve seat,



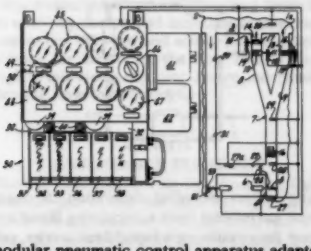
and with a closed bypass line, the through-flow openings sealingly resting on the valve seat of the valve means by controlling the bypass line means.

4,456,168

MODULAR FLUID CONTROL APPARATUS AND METHOD OF MAKING

Richard N. Laakaniemi, Hales Corners, and Paul E. Wichman, Brookfield, both of Wis., assignors to Johnson Controls, Inc., Milwaukee, Wis.

Filed Jan. 22, 1981, Ser. No. 227,493
Int. Cl.³ F24F 7/06
U.S. Cl. 236—49 **24 Claims**



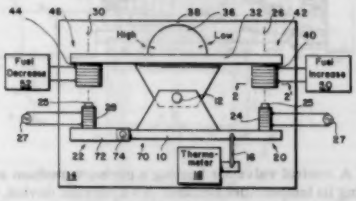
6. A modular pneumatic control apparatus adapted to control air handling equipment including heating units, cooling units, humidifier units, air damper units and air sensing units and each of said units operated in a plurality of control modes in response to pneumatic operating signals, comprising a manifold circuit board having a plurality of multiple input/output module connectors including one for each unit and a plurality of output port connectors for providing output fluid signals to said units, said module connectors each being connected to a preselected output port connector for establishing a predetermined control for a controlled unit, and a plurality of function control modules for each of said module connectors and said modules being separated into a plurality of module families, each of said family of modules defining a family operating modes for a controlled unit, each of said function control modules for each of said module connectors having a body member with a multiple input/output port connector arranged in the same configuration as the corresponding module connector and being constructed and arranged to respond to selected corresponding input signals on said manifold circuit board to develop output signals to operate the corresponding controlled unit and adapted to produce anyone of a plurality of different operating modes, said function control modules each including said body member having a flow control manifold member having flow passageways and including a plurality of external releasable connection means in said body member connected to said flow passageways, said releasable connection means establishing selective fixed physical attachment to said body member and said manifold member establishing fluid connection of a plurality of external logic nd control devices to said body member and external fluid connected devices to define the control function and integrated self-contained control sequence unit within said module responsive to an input signal at said input/out connector, said control sequence being defined by the selection of different external logic and control device.

4,456,169

ELECTRO-MECHANICAL STEADY STATE THERMOSTAT

Clifford M. Martin, General Delivery, Tarpon Springs, Fla. 33589

Filed Apr. 11, 1983, Ser. No. 483,593
Int. Cl.³ G05D 15/00, 23/12
U.S. Cl. 236—78 D **23 Claims**



1. A steady state thermostat, comprising:

a temperature sensor operated arm pivotally mounted on a base pivot, operatively connected to a thermo-mechanical transducer, and having first and second ends, for undergoing pivotal motion with respect to said base pivot in response to said thermomechanical transducer sensing a change in the existing ambient temperature;

a temperature setting arm pivotally mounted on said base pivot and having first and second ends, for receiving a selected orientation setting corresponding to a desired ambient temperature to be achieved;

a first magnetic field source mounted on said first end of said sensor arm coincident with a first axis and a second magnetic field source mounted on said second end of said sensor arm coincident with a second axis;

a first magnetic field sensor mounted on said first end of said setting arm coincident with said first axis and adapted for proximate positioning with respect to said first magnetic field source when said selected orientation of said setting arm corresponds to said desired ambient temperature being higher in magnitude than said existing ambient temperature;

a second magnetic field sensor mounted on said second end of said setting arm coincident with said second axis and adapted for proximate positioning with respect to said second magnetic field source when said selected orientation of said setting arm corresponds to said desired ambient temperature being lower than said existing ambient temperature;

said first magnetic field sensor being operatively connected to a first means for increasing said existing ambient temperature and said second magnetic field sensor being operatively connected to a second means for decreasing said existing ambient temperature;

said first means operatively increasing said existing ambient temperature in response to said proximate positioning of said first magnetic field sensor with respect to said first magnetic field source;

said second means operatively decreasing said existing ambient temperature in response to said proximate positioning

of said second magnetic field sensor with respect to said second magnetic field source;

whereby steady state control of said ambient temperature is achieved.

4,456,170

CONTROL VALVE

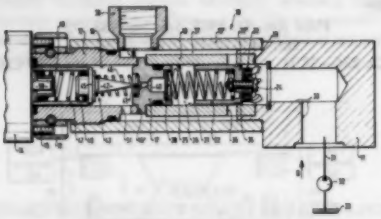
Dieter Weigle, Urach; Wilhelm Zirps, Hemmingen, and Uwe Schaub, Vaihingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 29, 1982, Ser. No. 393,364

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1981, 3127729

Int. Cl.³ G05D *23/275*

U.S. Cl. 236—84 7 Claims



1. A control valve for heating a pressure medium and maintaining its temperature constant in a hydraulic device, comprising a control slider provided with throttling means for throttling a pressure medium and displaceable under the action of the latter; a pilot valve associated with and influencing a position of said control slider, said pilot valve having a valve seat and a spring-loaded valve member movable between open and closed positions; a spring arranged to load said valve member of said pilot valve; a thermosensor arranged to sense the pressure medium flowing through the control valve and to determine throttling of the pressure medium; and an electromagnet controlled by said thermosensor and acting upon said pilot valve so as to open the latter and to thereby control the temperature of the pressure medium, said spring being located between said electromagnet and said valve member and in the open position of said valve member and with said electromagnetic being deactivated being at most partially pre-tensioned, and upon actuation of said electromagnet and assuming by said valve member the closed position said spring being tensioned to a value corresponding to an opening pressure.

4,456,171

VEHICLE HEATER

Reiner Friedl, Starnberg, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Gauting, Fed. Rep. of Germany

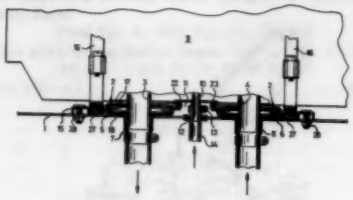
Filed Sep. 8, 1982, Ser. No. 415,998

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1981, 3136833

Int. Cl.³ B60H *1/02*

U.S. Cl. 237—12.3 C 29 Claims

1. Vehicle heater with a heating unit comprising an air intake connection and an exhaust connection, said connections being respectively communicable, through a bottom wall of a vehicle, with corresponding inlet and outlet ducts located on an opposite side of said bottom wall therefrom, wherein a coupling unit, that is attachable to the vehicle bottom wall, is provided for detachably interconnecting said inlet and outlet connections of the heating unit indirectly with said inlet and outlet ducts, said coupling unit comprising contact pressure couplings, equipped with gaskets for receiving said inlet and outlet connections of the heating unit, and, associated therewith, coupling pipe sections which are outwardly directed for connection with said inlet and outlet ducts, whereby the heating unit on one side of the bottom wall is detachable from said coupling unit independent of the connection between the coupling unit and said ducts on the opposite side of said bottom wall.



4,456,172

METHOD OF AND APPARATUS FOR THE DEGASIFICATION OF CIRCULATION SYSTEMS FOR LIQUIDS

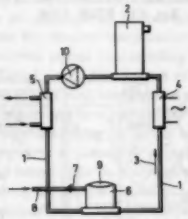
Franciscus Roffelsen, Helmond, Netherlands, assignor to Spiro Research B.V., Helmond, Netherlands

Continuation of Ser. No. 017,083, Mar. 5, 1979, abandoned. This application Jul. 1, 1981, Ser. No. 279,259

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1978, 2810583

Int. Cl.³ F24D *3/10*

U.S. Cl. 237—66 6 Claims



1. Heating system including deaeration of dissolved extremely small gas bubbles from a circulating liquid comprising a closed loop for circulating a liquid heat carrier, said closed loop having an upper horizontally extending part, means in said closed loop for circulating the liquid heat carrier, means in said closed loop for heating the liquid heat carrier, a branch line connected to and extending upwardly from said horizontally extending part of said closed loop immediately adjacent to and downstream from said means for heating the liquid heat carrier for containing a body of the liquid heat carrier therein in the at-rest condition with the lower end of said branch line and said horizontally extending part of said closed loop forming an interface between the liquid in said closed loop and the liquid in said branch line so that the liquid in said closed loop continues to flow past the interface at a temporarily reduced rate of flow velocity whereby extremely small gas bubbles can be released from the circulating liquid at the interface into said branch line, an air separator connected to said branch line upwardly from the interface with said closed loop and forming a continuation of said branch line for containing the body of liquid heat carrier in the at-rest condition, said circulating means comprising a pump located in said closed loop adjacent to and downstream from said branch line containing said air separator so that the liquid flowing in said closed loop past said air separator enters the suction side of said pump, said air separator having an enclosed air collecting chamber, and a float-controlled valve connected to said aid collecting cham-

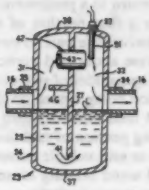
ber for regulating flow of air of gas from the collecting chamber to the ambient air.

4,456,173

ENERGY LOSS DETECTION SYSTEM

David W. Miner; Mark D. Driscoll; John E. Sorenson; Robert T. Kirchner, and David A. Keech, all of Three Rivers, Mich., assignors to Armstrong International, Inc., Three Rivers, Mich.

PCT No. PCT/US81/00025, 371 Date Sep. 2, 1981, 102(e) Date Sep. 2, 1981, PCT Pub. No. WO81/02203, PCT Pub. Date Aug. 6, 1981
Continuation-in-part of Ser. No. 113,835, Jan. 21, 1980, Pat. No. 4,305,548. This PCT application Jan. 9, 1981, Ser. No. 303,251
The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.
Int. Cl.³ F24D 1/00
U.S. Cl. 237—67 9 Claims



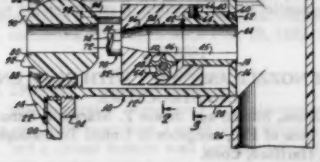
1. A steam system, including:
a source of steam;
a steam retaining device for retaining steam within said system, said device being connected along a steam line downstream of said steam source;
energy loss measuring means for measuring steam loss in said steam retaining device, and including means interposed in said steam line between said source and said steam retaining device for measuring the flow rate of steam therethrough to said steam retaining device, independent of any condensate flow therethrough.

4,456,174

ADJUSTABLE PULSE JET

John S. Neenan, 4100 Maple Tree Dr., Anaheim, Calif. 92807

Continuation-in-part of Ser. No. 093,754, Nov. 13, 1979, Pat. No. 4,320,541. This application Mar. 23, 1982, Ser. No. 361,109
Int. Cl.³ A61H 9/00; A47K 3/00; B05B 1/08
U.S. Cl. 239—8 20 Claims



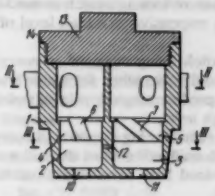
1. In a venturi type mixer wherein an increased velocity stream of liquid in a liquid conduit is projected through a jet nozzle into a mixing chamber and pulls gas from a gas conduit into the mixing chamber by venturi action for mixture with the liquid and discharge from the chamber, the improvement comprising
a flow disturbing member mounted for rotation in said mixing chamber downstream of said jet nozzle for intermittently disturbing the flow of liquid in said chamber so as to intermittently disturb the venturi action and the pulling of gas into the chamber, whereby the discharge of liquid and gas from the chamber pulsates,
a rotor mounted upstream of said nozzle and positioned to intercept a portion of the stream of liquid from said liquid conduit, and
means for interconnecting said rotor and flow disturbing member.

4,456,175

NOZZLE ASSEMBLY FOR LIQUID SPRAYING IN COKE OVEN ASCENSION PIPE

Alexandr D. Mamrosov; Oleg V. Fedulov; Alexandr S. Kolivashko; Boris I. Meniovich, all of Dnepropetrovsk, and Vladimir A. Neboga, Donetsk, all of U.S.S.R., assignors to Dnepropetrovsky Khimiko-Tekhnologichesky Institut Imeni F. E. Dzerzhinskogo, Dnepropetrov, U.S.S.R.

Filed Dec. 3, 1981, Ser. No. 327,265
Int. Cl.³ B05B 7/10
U.S. Cl. 239—113 4 Claims



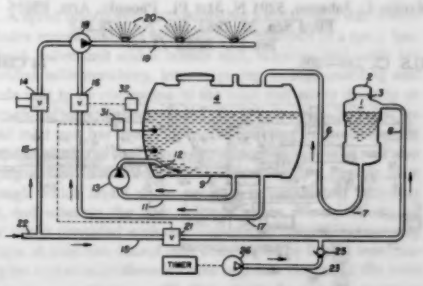
1. A nozzle for spraying at least two liquid portions into the ascension pipe of a coke oven comprising:
a body
at least two cylindrical swirl chambers, said chambers being spaced laterally from each other and having different diameters, each chamber having a separate tangential inlet adapted for communication with the source of a respective one of said liquid portions and a separate axial spray outlet adapted for independent communication with said ascension pipe; and
a by-passing passage extending between said chambers for the flow of liquid therebetween.

4,456,176

APPARATUS FOR PROCESSING AND DISPENSING FERTILIZER OR INSECTICIDE

Joseph L. Agius, 1778 Spruce, Livermore, Calif. 94550

Filed Sep. 13, 1982, Ser. No. 417,475
Int. Cl.³ B05B 7/04
U.S. Cl. 239—142 6 Claims



1. An apparatus for mixing and dispensing a powdered or particulate chemical compound comprising:

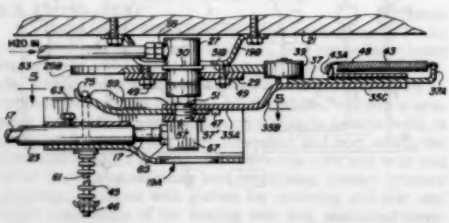
a pressure vessel of predetermined capacity having access means through a top opening for receiving said compound;
a mix tank;
the bottom of said vessel being connected through suitable piping to the top of said mix tank;
a source of raw water under pressure connected to the top of said vessel by a suitable pipeline;
a first solenoid operated stop valve in said pipeline;
a first outlet pipe connected from the bottom of said tank to an electrically driven circulating pump;
said circulating pump having a discharge connected back to said mix tank;
a mixing nozzle positioned on the outlet end of said discharge within said mix tank;
a second outlet pipe connected from the bottom of said mix tank to a mixing pump;
a second solenoid operated stop valve in said second outlet pipe;
a first pressure sensing switch connected to said mix tank and being responsive to a low level of water in said tank;
a second pressure sensing switch connected to said mix tank and being responsive to a high level of water in said mix tank;
said first switch being disposed to energize and open said first solenoid valve when the water level in said mix tank reaches a predetermined low level and close at a predetermined high level;
said second switch being disposed to energize and open said second solenoid valve when the said water level reaches a predetermined high level and close at a predetermined low level;
said source of raw water under pressure being connected to said mixing pump through a manually operated stop valve;
the discharge of said mixing pump being connected to a water distribution system;
an electrical power supply source to said electrical equipment;
an electrically driven compressor;
said electrically driven compressor being connected to discharge air under pressure into said pressure vessel;
said electrically driven compressor being supplied with driving power from said source through an electrical timer;
said timer being energized to operate said compressor intermittently for a predetermined period when said water level is at a predetermined high level in said mix tank;
whereby any remaining chemical in said vessel is discharged into said mix tank.

4,456,177

SELF-RETURN MECHANISM FOR CAR WASH HOSE BOOM SWIVEL ASSEMBLY

Archie L. Johnson, 5201 N. 31st Pl., Phoenix, Ariz. 85016

Filed Sep. 29, 1982, Ser. No. 428,313
Int. Cl.³ B05B *15/06*
U.S. Cl. 239—209 **14 Claims**



1. A self-returning hose boom swivel apparatus for a car wash bay, said apparatus comprising in combination:

(a) a spray wand holdable by a user for directing a high pressure liquid spray at a vehicle being washed in said bay;
(b) wand holding means attached to a side wall of said bay for securely holding said spray wand when it is not in use;
(c) a flexible feed hose connected to said spray wand for supplying highly pressurized liquid to said spray wand;
(d) a hose boom swivel assembly attached to a generally central portion of a ceiling of said bay for supporting an elevation portion of said feed hose at any point along a circular locus of points around said generally central portion of the ceiling so that when a user carries said spray wand entirely around said vehicle in the course of washing all sides of said vehicle, said elevated portion of said feed hose freely travels along said circular locus of points in order to prevent said feed hose from being draped across said vehicle, said hose boom swivel assembly having a stationary part and a swivelable part, said swivelable part having a swivel range about a vertical axis;
(e) self-returning means for automatically causing said swivelable part to return to a predetermined position from any position within a first portion of said swivel range and allowing said swivelable part to swivel non-preferentially in either direction about said vertical axis from any position within the remainder of said swivel range, said predetermined position being a position that holds said elevated portion of said feed hose adjacent to said side wall and holds a drooping portion of said feed hose out of the path of said vehicle as said vehicle enters said bay if said spray wand is in said wand holding means;
said self-returning means including
(i) camming means for supporting a camming surface having a first portion corresponding to said first portion of said swivel range and having a continuum of successive locations having associated therewith successively reduced potential energies, one of said locations being a minimum potential energy location, said camming surface having a second portion corresponding to said remainder of said swivel range and also having a substantially constant potential energy associated therewith;
(ii) cam following means for engaging said camming surface and preferentially following said first portion of said camming surface to said minimum potential energy location thereof;
(iii) first means connected to said camming means for holding said camming surface in fixed relation to one of said stationary part and said swivelable part;
(iv) second means connected to said cam following means for holding a portion of said cam follower means in fixed relation to the other of said stationary part and said swivelable part;
said cam following means and said camming means cooperating to return said swivelable part to said predetermined position from any position in said first portion of said swivel range as said cam following means seeks said minimum potential energy location of said camming surface.

4,456,178

EXHAUST NOZZLE ASSEMBLY WITH DUAL UNISON RING STRUCTURE

Dennis C. Jones, Stuart, and James F. Marshall, Palm Beach Gardens, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

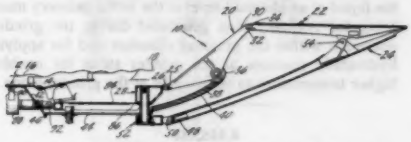
Filed Dec. 27, 1982, Ser. No. 453,191
Int. Cl.³ B64C *15/06*
U.S. Cl. 239—265.39 **5 Claims**

1. In a gas turbine engine having an axis and comprising engine fixed structure and a convergent/divergent exhaust nozzle assembly supported from said structure, said structure including case means, the improved nozzle assembly comprising:

unison ring means including an inner annular box section disposed around the engine axis and an outer annular box

section disposed around the engine axis radially outwardly of said inner box section and radially aligned therewith, said case means being disposed between said inner and outer box sections and having a plurality of circumferentially spaced apart axially extending slots therethrough;

said unison ring means further including a plurality of circumferentially spaced apart radially extending pins each having an inner and outer end, each pin extending into one of said box sections and across the radial height thereof and being fixed relative thereto, said pins extending radially through one of said slots in said case means into and across the radial height of said other one of said box sections and being fixed axially relative to said other one of said box sections and movable radially relative thereto, said pins providing torsional stiffness to said unison ring means;



an axially translatable variable area convergent nozzle comprising a plurality of rotatable and translatable first flaps having upstream ends pivotally connected to said inner box section;

an axially translatable variable area divergent nozzle downstream of said convergent nozzle and including a plurality of second flaps pivotally connected to said first flaps;

connecting means having downstream ends pivotally connected to said second flaps and upstream ends pivotally connected to said outer box section; and

actuation means connected to said unison ring means for translating one of said box sections in an axial direction, wherein said other one of said box sections is translated axially simultaneously, said translating force being transmitted to said other one of said box sections through said pins.

4,456,179

MIST GENERATOR AND HOUSING THEREFOR

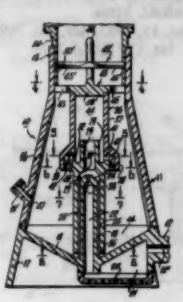
Ann S. Kremer, Darien, Conn., assignor to Eastfield Corporation, Darien, Conn.

Continuation of Ser. No. 206,049, Nov. 12, 1980, abandoned, which is a continuation of Ser. No. 118,527, Feb. 4, 1980, abandoned, which is a continuation of Ser. No. 900,881, Apr. 28, 1978, abandoned. This application Feb. 19, 1982, Ser. No. 350,273

Int. Cl.³ B05B *7/30*

U.S. Cl. 239—338 **4 Claims**

1. A mist generator comprising a frusto-conical housing having a relatively large base, a small outlet opening on the top thereof, and a closed bottom wall forming a liquid reservoir, means within said housing for generating a mist, the last said means including means for producing a mist, means defining a closed chamber, the mist producing means extending into said chamber defining means for discharging said mist within said chamber, said chamber defining means having a plurality of outlets disposed rearwardly thereof for discharging said mist into the conical space defined by said housing and in a direction downwardly and outwardly from said outlets whereby certain of the larger particles of appreciable mass return directly to the reservoir while other of the larger particles move through paths of relatively large radii striking the frusto-conical housing wall for return to the reservoir while the small



particles of said mist are carried upwardly with the air stream and are discharged from said housing outlet.

4,456,180

SPRAY NOZZLE ASSEMBLIES

Marcus Lury, Sutton, England, assignor to Lurmark Limited, Cambridgeshire, England

Filed Sep. 8, 1981, Ser. No. 300,186

Claims priority, application United Kingdom, Sep. 29, 1980, 8031387; Apr. 24, 1981, 8112785

Int. Cl.³ B05B *1/30*

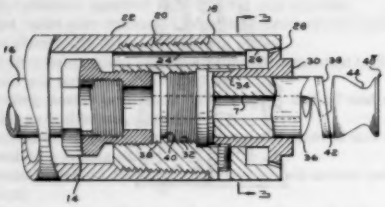
U.S. Cl. 239—397 **4 Claims**

1. A spray nozzle system comprising a liquid inlet unit which includes means enabling said unit to be clamped to a spray bar, a check valve unit and a nozzle unit, wherein said units are provided with matching, inter-engaging fittings enabling said nozzle unit to be connected to the inlet unit either directly or through the intermediary of said check valve unit, wherein the liquid inlet unit has clamping means enabling its attachment at any point along the length of a dry spray bar, said inlet unit also having at least one tail pipe for connection of a flexible hose through which liquid under pressure is supplied to said inlet unit, and wherein the inlet unit comprises a body having an axial outlet provided with one of said matching, interengaging fittings, at least one lateral inlet constituted by said at least one tail pipe and an axial threaded boss opposite the outlet, the inlet unit also comprising a split ring clamp having an aperture freely receiving said threaded boss, whereby the screwing of a nut on to the boss both secures the said body to the clamp and the clamp to the spray bar.

4,456,181
GAS LIQUID MIXING NOZZLE

Richard C. Burnham, Greenfield, Mass., assignor to Bete Fog Nozzle, Inc., Greenfield, Mass.

Filed Apr. 19, 1982, Ser. No. 369,565
Int. Cl.³ B05B 7/10
U.S. Cl. 239—403 1 Claim

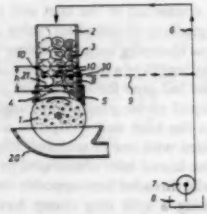


1. Mixing Nozzle for gas and a liquid slurry comprising a tubular member having a plurality of longitudinally extending, circumferentially spaced gas supply passages communicating at their outer ends with an annular chamber adjacent the outer end of said nozzle, an annular gas flow orifice being in communication with said annular chamber, a discrete, abrasion-resistantinsert removably fitted within the tubular member and having an axial bore for liquid flow therethrough, said insert including at its outer end a helical vane disposed externally of said tubular member and in axial alignment with said bore, said vane having a pitch such that liquid flow through the bore impinges against said vane and is deflected outwardly into a generally flat sheet approximately normal to the axis of the nozzle, the outer end of said helical vane terminating in a deflector having a generally flat inner end surface, the outer periphery of said deflector having a throat portion of reduced diameter intermediate its inner and outer end surfaces, said annular orifice being coaxial with the bore of said insert and having a generally conical cross-section and being directed such that an extension thereof intersects the liquid spray at a substantial distance outwardly of said vane whereby pressurized gas issuing from said gas flow orifice mixes with said liquid spray to form a high-velocity conical spray.

4,456,182
PULP GRINDER WITH LIQUID RETENTION

Richard Süttinger, Schongau; Ernst Böttger, Herbrechtingen-Eselsburg; Hans O. Henrich, Heidenheim; Theodor Bähr, Heidenheim, and Helmut Thumm, Heidenheim, all of Fed. Rep. of Germany, assignors to J. M. Voith GmbH, Fed. Rep. of Germany

Filed Dec. 4, 1981, Ser. No. 327,437
Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047033
Int. Cl.³ B02C 19/12, 23/36
U.S. Cl. 241—46.02 5 Claims



1. A wood pulp grinder, comprising:

a grinding chamber; an abrasive grinder stone in the grinding chamber and the stone being movable in the grinding chamber for grinding wood in contact with the grinder stone;

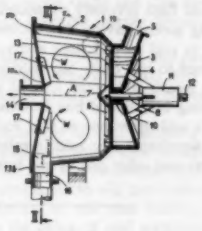
wood delivery means for containing and delivering wood to the grinder stone for grinding; the wood delivery means comprising a wood supply chute which at the grinder stone is defined by front and rear circumferentially spaced apart sealing plates and by lateral cover plates wrapped around the grinder stone and extending between the sealing plates; the wood delivery means is also to be for containing liquid therein in the presence of which the wood is to be ground;

the sealing and cover plates being sealed to the grinder stone for defining sealing means between the wood delivery means and the grinder stone for retaining liquid in the delivery means and for holding the liquid at an elevated level only in the delivery means above the bottom of the wood delivery means, while permitting the liquid in the wood delivery means to move out with the ground wood; the liquid at an elevated level in the wood delivery means being for retaining heat generated during the grinding operation within the grinding chamber and for applying hydrostatic pressure at the grinder stone for enabling higher temperature to be attained at the grinder stone.

4,456,183
FIBERIZER FOR STOCK SUSPENSIONS FOR FABRICATING PAPER

Alfred Christ, Zärich, Switzerland, assignor to Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed Mar. 1, 1982, Ser. No. 353,643
Claims priority, application Switzerland, Mar. 23, 1981, 1933/81
Int. Cl.³ B02C 23/36
U.S. Cl. 241—46.17 8 Claims



1. A fiberizer for stock suspensions for fabrication of paper, comprising:

a closed housing possessing a circumferential jacket in a form of a body of rotation;

said housing possessing an end portion;

a screen arranged within said housing at a region of said end portion;

means for imparting a rotational movement to a stock suspension contained within an internal chamber of said housing about a lengthwise axis of said housing;

said housing possessing an end wall located remote from said screen;

guide means provided for said end wall of said housing;

said guide means being arranged transversely with respect to a tangential circumferential direction of the housing and protruding into the internal chamber of said housing;

said end wall is located opposite said screen;

said guide means are mounted at said oppositely located end wall and extend radially with respect to said end wall and said lengthwise axis of the housing;

said housing defines a good stock chamber at an end region thereof located remote from said end wall;

said good stock chamber being located at a side of said screen which faces away from said end wall; and

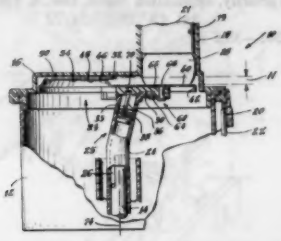
said guide means inhibiting return flow of good stock from said good stock chamber through said screen.

4,456,184

REMOVABLE HEAD ROTARY TOOL FOR FOOD PROCESSORS

James E. Williams, Stamford, and Edward R. Kozlowski, Southport, both of Conn., assignors to Wilson Research & Development, Inc., Greenwich, Conn.

Filed Jun. 18, 1981, Ser. No. 274,720
Int. Cl.³ B02C *18/18*
U.S. Cl. 241—92 **24 Claims**



1. A removable head rotary tool for use in food processors of the type having an upright working bowl in which said rotary tool is mounted for rotation about an axis within said bowl by motor drive means, a removable cover securable on said bowl for covering said bowl and said rotary tool during operation and a feed tube for feeding food items to said rotary tool in said bowl, said removable head rotary tool comprising:

an elongated hub having a flange-like upper coupling member and a lower coupling portion adapted to be coupled to and rotated by said motor drive means,

said flange-like upper coupling member has a plurality of circumferentially spaced teeth extending radially from its periphery,

a horizontal disc-like tool head cutting means thereon for processing food items applied to said tool head,

receptacle means on the lower surface of said tool head, said receptacle means being open in the axial direction for accommodating the insertion of said flange-like upper coupling member in the axial direction into said receptacle means with limited rotational movement of said flange-like upper coupling member therein for removably mounting of said tool head on said flange-like upper coupling member of said hub by aligning and turning said flange-like upper coupling member in said receptacle means,

said receptacle means has a plurality of spaced clearance recesses open in the axial direction for receiving said spaced teeth of said flange-like upper coupling member inserted in the axial direction therein,

said receptacle means having retainer lips between said clearance recesses,

said spaced teeth being insertable in the axial direction into said clearance recesses, and

said flange-like upper coupling member being turnable within said receptacle after axial insertion therein for becoming captured in said receptacle means when said spaced teeth are turned in said receptacle means for moving said spaced teeth into snug engagement in said receptacle above said retainer lips,

whereby other disc-like tool heads having different cutting structures for performing different food processing functions may be used on the same hub by changing tool heads without requiring a separate hub for each rotary tool.

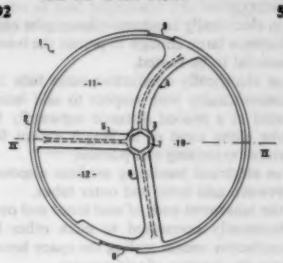
441-177 OG - 84 - 7

4,456,185

APPARATUS FOR TREATING FOOD

Patrick Ribassin, Fontenay sous Bois; Manuel Gallardo, and Alain J. L. Bertin, both of Chelles, all of France, assignors to Robot-Coupe, S.A., Bagnolet, France

Filed Feb. 9, 1982, Ser. No. 347,187
Int. Cl.³ B02C *18/12*
U.S. Cl. 241—92 **5 Claims**



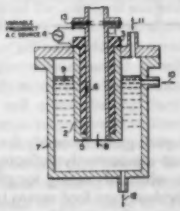
1. Kitchen apparatus for treating food, comprising a motor housed in a casing and a removable bowl mounted on the casing, the dimensions of the bowl being of substantially the same magnitude as the dimensions of the casings, a driving shaft passing through the bottom of said bowl when the bowl is mounted on the casing, a set of rotary tools connectable on said shaft, wherein the tools (**18**) are substantially flat disks, the diameter of which being substantially the same as the diameter of the bowl, a case (**28**) being provided in the motor casing (**23**) for enabling storage of said tools inside said casing, each tool (**18**) being connectable to said driving shaft by means of a carrier (**1**), said carrier comprising: a hub (**3**) formed with a central aperture (**7**) the cross section of which being substantially the same as the cross section of the driving shaft end, whereby any tool can be connected to the shaft via the carrier or when not in use can be stored in the case (**28**); a crown (**2**) having notches (**8, 9**) for receiving lugs (**19, 20**) provided on the periphery of each tool; and radial struts (**4, 5, 6**) connecting the crown to the hub, said struts defining three free spaces or intervals (**10, 11, 12**), one (**10**) of these intervals being substantially twice as big as the other adjacent intervals, one (**4**) of the struts being curved, and the rotary direction of the carrier being such that cut products pass through the biggest interval (**10**).

4,456,186

ELECTRICALLY HEATED REACTOR FOR HIGH TEMPERATURE AND PRESSURE CHEMICAL REACTIONS

Masao Ando, Yokohamashi, Japan, assignor to Chisso Engineering Co. Ltd., Tokyo, Japan

Filed Mar. 9, 1981, Ser. No. 241,942
Int. Cl.³ C21D *1/00*; H05B *3/00*
U.S. Cl. 219—300 **5 Claims**



1. An electrically heating reactor including

(a) a reactor vessel,
(b) an inlet opening in said reactor vessel for the introduction of raw material into the reactor vessel,
(c) an outlet opening in said reactor vessel for the removal of heated material from the reactor vessel,
(d) a heating means extending through said inlet opening and into the interior of said reactor vessel, said heating means including
(1) an electrically conductive inner tube having an interior diameter large enough to permit the introduction of the material to be heated,
(2) an electrically conductive outer tube that is arranged concentrically with respect to said inner tube and located at a spaced distance outwardly from the inner tube along most of its length except for the inwardlymost extending end portion,
(3) an electrical insulating medium disposed in the space between said inner and outer tubes,
(4) the innermost ends of said inner and outer tubes being electrically connected to each other by electrically conductive means sealing the space between said tubes from the interior of said reactor,
(5) an alternating current source connected between the ends of said inner and outer tubes at a point where these tubes extend outside said reactor vessel,
(6) said outer tube being made of ferromagnetic material and having a thickness greater than the depth to which the alternating current penetrates said outer tube, whereby the current is maintained within said outer tube and is prevented from entering said reactor vessel,
(7) said outer tube being in direct contact with the wall of said reactor vessel at said inlet opening to form a seal therebetween,

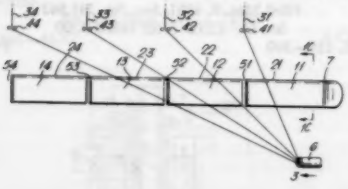
whereby when the alternating current source is energized current flows through the electrical circuit defined by said inner and outer tubes to generate heat, said current penetrating said outer tube to a depth depending upon the electrical and magnetic properties of said tube and the frequency of said alternating current course, the heat generated by said inner tube being imparted to the material flowing therethrough and the heat generated by said outer tube being imparted to the material exterior of said outer tube.

4,456,187

APPARATUS FOR INDIVIDUAL YARN SELECTION PARTICULARLY IN DONNING MULTICOP WINDERS

Allen A. Bloomfield, and Frank R. Wilson, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 219,280, Dec. 22, 1980, abandoned. This application Aug. 13, 1982, Ser. No. 408,098
Claims priority, application United Kingdom, Feb. 26, 1980, 8006407
Int. Cl.³ B65H *54/02, 54/20*
U.S. Cl. 242—18 PW **7 Claims**



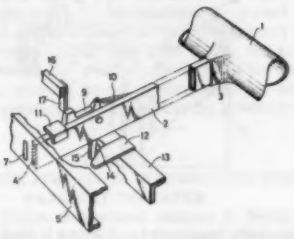
1. An elongate yarn guide assembly for selecting individual yarns from a group concurrently deflected over it and sliding laterally along it while advancing longitudinally from fixed spaced apart individual yarn feed means to moveable common yarn collection means, the assembly comprising a row of yarn guide members having yarn guiding surfaces separated by gaps characterized in that the yarn guiding surfaces of the guide members immediately beyond the gaps are inclined to, and at least partially face, the direction from which the yarns approach the gaps, whereby a yarn deflected over and sliding along the assembly passes over the guiding surfaces and the gaps without impedance from hooking except when the yarn lies in a plane wholly within a gap in which case it falls into that gap.

4,456,188

APPARATUS FOR SLACKING YARN IN WINDER

Shoji Sakai; Michiaki Fujiwara; Nobunori Kubota, and Koshi Noda, all of Kyoto, Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 3, 1981, Ser. No. 327,107
Claims priority, application Japan, Dec. 4, 1980, 55-174345
Int. Cl.³ B65H *54/22*
U.S. Cl. 242—35.5 R **13 Claims**



1. An apparatus for providing slack to a yarn during a joining of yarn ends to form the yarn to be wound in a spinning machine, which machine includes a plurality of machine units, each performing a winding operation, said machine units being disposed parallel to each other, said spinning machine being provided with a service truck adapted to travel along the plurality of machine units and containing a yarn joining means as well as two holding and guiding members for holding the yarn ends and for guiding the two yarn ends into the yarn joining means, comprising:

a shutter plate, mounted along said machine units of said spinning machine, having a plurality, in like number as the number of machine units, of elongated openings formed therein, one of said openings being in proximity to a corresponding machine unit and disposed to extend along said shutter plate in a direction parallel and adjacent to the running path of the yarn to be wound in that machine unit;

a plurality of slack tubes, one provided in each machine unit for slacking and retaining excess yarn of its machine unit therein, each slack tube having a suction opening at one end thereof, each said suction opening being in close contact with a back surface of said shutter plate, each said slack tube being adapted to swivel between a first position and a second position;

a suction means for providing suction, communicated with the end of each slack tube opposite that in close contact with said shutter plate;

a first movable member, adapted to swivel at least one of said slack tubes into its first position in response to an externally provided signal calling for slacking of the yarn on that machine unit wherein said slack tube is swiveiled, in which first position said suction opening of the swivelled slack tube is aligned with the corresponding opening of said shutter plate; and

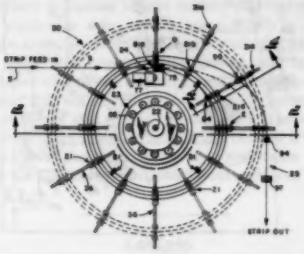
a second movable member adapted to return each slack tube from its first position into its second position upon termination of said externally provided signal, in which second position the suction opening of the returned slack tube is separated from its corresponding opening in said shutter plate and the sucking action of said slack tube is stopped.

4,456,189

CONTROLLED EXPANSION STRIP ACCUMULATOR

Donald J. Wheeler, Belton, S.C.; Christopher Cooper, Brunswick, and Charles R. Krejsa, Northfield, both of Ohio, assignors to International Patents Limited, Grand Cayman, Cayman Islands

Filed May 21, 1982, Ser. No. 380,531
The portion of the term of this patent subsequent to Oct. 18, 2000, has been disclaimed.
Int. Cl.³ B65H *17/42, 75/02*
U.S. Cl. 242—55 24 Claims



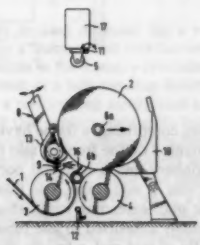
1. An accumulator for storing a variable length of strip material comprising a plurality of circumferentially spaced strip guide means positively defining a spiral path for a plurality of turns of strip material with adjacent turns thereof being radially spaced apart, and means for uniformly moving said guide means to effect radial expansion and contraction of the spiral strip path wherein each strip guide means includes a radially moveable guide basket having mounted therein a plurality of radially spaced strip guides which guide and contain the strip material along the spiral path and maintain adjacent turns of the strip material radially space apart.

4,456,190

ARRANGEMENT FOR WINDING OF WEBS

Martti Karttunen, Kellokoski; Heikki Niskanen, and Hannu Oinonen, both of Järvenpää, all of Finland, assignors to Oy Wartsila Ab, Helsinki, Finland

Filed Oct. 19, 1981, Ser. No. 312,503
Claims priority, application Finland, Oct. 21, 1980, 803300
Int. Cl.³ B65H *17/12, 19/26*
U.S. Cl. 242—56 R 15 Claims



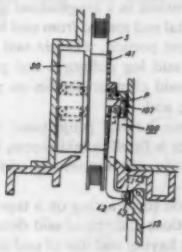
1. An arrangement for winding a web, in particular a paper web, onto a roll core or the like in a two drum winder comprising two support drums and a rider roll surrounding said roll core and means for leading said web from below up between said support drums, said arrangement including means for supplying, during the final stage of a roll winding process, a new roll core between the roll made in said process and said support drums, a web cutter for transverse cutting of said web at a position above said new roll core and means for the transfer of a finished roll away from said support drums, and arrangement further comprising means for guiding a front end of a transversely cut web to form the beginning of a new roll around said new roll core, said means comprising a plurality of guiding units spaced-apart in the circumferential direction of said new roll core, said units including means for creating pneumatic jets for guiding said web end tightly around said new roll core, one of said pneumatic jets being positioned in close relationship to said web cutter.

4,456,191

SPOOL MOUNTING APPARATUS

John Knott, Wells, England, assignor to EMI Limited, Hayes, England

Filed Oct. 13, 1981, Ser. No. 311,019
Claims priority, application United Kingdom, Oct. 15, 1980, 8033295
Int. Cl.³ G03B *1/04;* G11B *15/32, 23/10*
U.S. Cl. 242—68.1 6 Claims



1. A spool mounting apparatus comprising a housing having an opening to a cavity for receiving a spool, means for closing the opening, and respective driving and driven members mounted within the cavity for rotation, the driven member being capable of clamping a received spool against the driving member so as to effect rotation of the spool, and being coupled to the closure means in such a way that when said closure means approaches or assumes a closed condition, the clamping action of the driven member is effected, wherein said driven member comprises a free running disc member capable of movement along an axis substantially common in said closed condition, to an axis of said driving member, the disc member also having limited movement away from a plane perpendicular to said axis, wherein the cavity is defined by two substantially parallel side walls, an arcuate wall and said opening, and wherein projections of said closure means are pivotally mounted to levers pivotally mounted to bell cranks, the bell cranks being pivotally mounted to blocks secured in a side wall of said cavity, said bell cranks having fixed pin attachments slideably located within respective slots formed in a coupling member attached to said free running disc member, said coupling member acting on said disc member in response to rotation of said bell cranks resulting from displacement of said levers as a consequence of movement of said closure means, said rotation of said bell cranks causing said pin attachments to bear against one side of their respective slots, thereby effecting translation of said disc member along said common axis.

4,456,192

MAGNETIC TAPE CLAMPING DEVICE

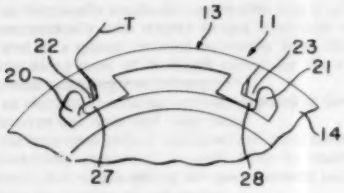
Takateru Sato, and Haruo Shiba, both of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Jan. 20, 1982, Ser. No. 341,122

Claims priority, application Japan, Mar. 20, 1981, 56-38219[U]

Int. Cl.³ B65H *75/28*

U.S. Cl. 242—74.1 **1 Claim**



1. In a circular reel hub formed of a resilient material, a magnetic tape clamping device comprising:

a recess in a rim of said hub, said recess having a circular bottom and two circumferential ends;

an undercut portion at each said end of said recess and adjacent said bottom, each said undercut portion extending into said hub and radially outward, each said undercut portion defining a portion of said hub as a leg extending toward said bottom in a longitudinal direction and terminating at a distal end spaced from said bottom by a portion of said undercut portion, wherein said longitudinal direction of each said leg defines a line passing a center of curvature of said circular bottom on a side opposite the other said leg; and

a clamping piece having projections which, when said clamping piece is fitted in said recess, fit in said undercut portions between said bottom and said distal ends of said legs,

whereby a tension force acting on a tape held between one of said projections and one of said distal ends will tend to distort the leg having said one of said distal ends such that said longitudinal direction of said leg approaches a radial direction so as to increase the frictional force between said bottom, said tape and said distal end.

4,456,193

WEB ADVANCEMENT SENSING METHODS AND APPARATUS

Dwight G. Westover, Sierra Madre, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sep. 16, 1981, Ser. No. 302,866

Int. Cl.³ B65H *28/18, 17/26, 25/04*

U.S. Cl. 242—75.42 **9 Claims**

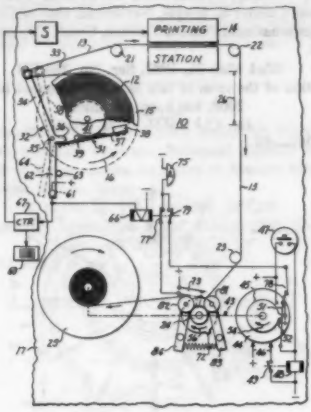
1. Apparatus for sensing advancement of a web from a web supply, comprising in combination:

means including a compliance arm for forming web from the supply into a loop;

means for inhibiting removal of web from the supply into said loop, including a web supply brake having means for resiliently biasing said compliance arm in the sense of a restoration of said loop;

means for pulling web from said loop thereby tightening said loop and moving said compliance arm;

means on said compliance arm for releasing said brake for a restoration of said loop; and



means including a projection of the compliance arm responsive to tightening of said loop for sensing advancement of said web.

4,456,194

FISHING REEL WITH CONTROL LEVER GUARD

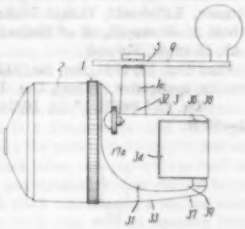
Hideo Noda, Osaka, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Continuation of Ser. No. 169,313, Jul. 16, 1980, abandoned. This application Aug. 11, 1982, Ser. No. 407,141

Claims priority, application Japan, Jul. 27, 1979, 54-104389[U]; Jul. 27, 1979, 54-104390[U]

Int. Cl.³ A01K *89/01*

U.S. Cl. 242—84.2 A **3 Claims**



1. A fishing reel comprising: a frame having a mounting leg, a front cover mounted on the front of said frame and having a round outer periphery and a rear end portion, a rear cover mounted on the rear of said frame, said frame carrying a non-rotatable tubular shaft extending longitudinally of said reel, a rotary shaft rotatably supported to said tubular shaft and movable longitudinally of said reel, a handle shaft, and a transmitting mechanism for transmitting rotation of said handle shaft to said rotary shaft, said tubular shaft carrying a spool, said rotary shaft carrying a rotary member, said rotary member having a wind-up control mechanism for winding a fishing line on said spool, said rotary shaft being movable forward to operate said wind-up control mechanism to free said fishing line, said rear cover having a control lever for moving said rotary shaft forward to operate said wind-up control mechanism, said control lever being positioned at an upper rearward corner of the rear portion of said rear cover and exposed at its outer

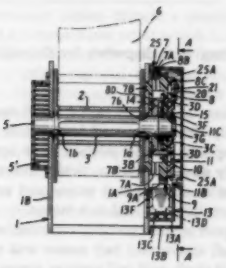
surface, said rear cover having an upper wall which has opposite widthwise sides and which is curved upwardly toward said first cover to form a concave grasping surface, said upper wall having a front end portion consecutive to the rear end portion of said front cover and a rear end portion, a pair of first and second side walls in continuation of both widthwise sides of said upper wall respectively, said second sidewall being formed in a circular arc which has an outer diameter approximately equal to that of the round outer periphery of said front cover, and a rear wall, said rear end portion of said upper wall being horizontal and consecutive to said rear wall, said rear wall having at a widthwise intermediate portion thereof an opening which is located at said corner, said opening having opposite widthwise sides which are defined by extensions extending rearwardly from said upper wall and first and second side walls, said control lever closing said opening and moving therewithin when operated, said extensions each having an upper wall which extends substantially horizontally at a rear end portion of said rear cover and which is substantially at the same level as an upper surface of said control lever, so that said control lever is supported between and inside said extensions so as not to project substantially outwardly of said extensions.

4,456,195

EMERGENCY LOCKING VEHICLE SAFETY BELT RETRACTOR

Juichiro Takada, 3-12-1, Shinmachi, Setagayaku, Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 327,029
Claims priority, application Japan, Dec. 17, 1980, 55-177135
The portion of the term of this patent subsequent to Jul. 12, 2000, has been disclaimed.
Int. Cl.³ A62B *35/02*; B65H *75/48*
U.S. Cl. 242—107.4 B **2 Claims**



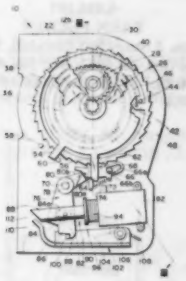
1. An emergency locking retractor for a vehicle occupant restraint belt having a frame, a belt reel carried by a shaft that is mounted for rotation in the frame, a rewinding spring urging the reel shaft to rotate in a belt-winding direction to wind the belt onto the reel, a reel locking mechanism carried by a portion of the reel shaft that extends outwardly from a side portion of the frame, the locking mechanism including a circular row of equally spaced-apart first locking ratchet teeth on the outer face of said side portion of the frame and disposed concentrically to the axis of rotation of the reel shaft, a flange affixed on the reel shaft portion outwardly of the frame side portion, an inner wheel received on the reel shaft outwardly of the flange for limited axial movement toward and away from the flange and having a row of second locking ratchet teeth engagable with the first locking ratchet teeth upon movement of the inner wheel toward the frame, an inertia spring engaging the inner wheel and urging it in a direction away from the flange, an outer wheel received on said shaft portion outwardly of the inner wheel and retained thereon against movement in a direction axially of the shaft away from the frame, coacting cam elements on the inner and outer wheels adapted to cam the inner wheel toward the frame upon rotation of one of the wheels relative to the other, one of the wheels being coupled to the shaft for rotation conjointly therewith and the other wheel being rotatably carried on the shaft portion and having an inertia that causes it to lag the rotation of the wheel that rotates with the shaft in response to a selected value of acceleration of the belt in the unwinding direction so that the inner wheel is thereupon shifted toward the frame by the cam elements, and the flange having lugs received in corresponding slots in the inner wheel and adapted to lock the reel shaft to the inner wheel when the inner wheel is locked to the frame by the locking ratchet teeth, and a cover attached to the frame and at least partly enclosing the reel locking mechanism characterized in that there is a brake member carried on the wheel that rotates with the belt reel, and the casing includes a circular cylindrical wall portion located radially outwardly of the path of the brake member, said brake member being movable outwardly into engagement with the cylindrical wall portion in response to a centrifugal reaction force on the brake member, thereby to retard the rotation of the reel and prevent relative rotation of the inner and outer wheels when rotation of the belt reel in the belt-winding direction is stopped abruptly.

4,456,196

SEAT BELT RETRACTOR WITH A TENSION ELIMINATOR

Juichiro Takada, Tokyo; Shuichi Ueno, Yokohama, and Kazuo Isamu, Yokosuka, all of Japan, assignors to Nissan Motor Co., Ltd. and Takata Kojyo Co., Ltd., both of, Japan

Filed Feb. 27, 1981, Ser. No. 239,140
Claims priority, application Japan, Mar. 7, 1980, 55-28077
Int. Cl.³ A62B *35/00*; B65H *75/48*
U.S. Cl. 242—107.6 **5 Claims**



1. A seat belt retractor having a tension eliminator comprising:

(a) a housing;

(b) a belt take up shaft supported for rotation about its axis by said housing, said shaft having said seat belt connected thereto and wound thereon within said housing;

(c) first biasing means for biasing said shaft to rotate in one direction to cause said belt to be retracted into said housing by being wound onto said shaft, and to permit said shaft to rotate in the opposite direction when said belt is extended from said housing;

(d) a pinion gear carried by said shaft for rotation therewith about said axis;

(e) an internal gear rotatable about said axis;

(f) an idler gear in meshed relationship with and establishing a drive connection between said pinion gear and said internal gear;

(g) a ratchet wheel rotatable about said axis, said ratchet wheel having external teeth;

(h) stop members located respectively on said ratchet wheel and said internal gear;

(i) second biasing means for interconnecting said ratchet wheel and said internal gear and for biasing the same for rotation in opposite directions about said axis, the said

rotation in opposite directions of said internal gear and ratchet wheel being limited by the mutual engagement of said stop members;

(j) a clutch disc rotatable about said axis, said clutch disc being in frictional contact with said internal gear;

(k) a pawl member located proximately to the external teeth of said ratchet wheel;

(l) a stop element engageable with said pawl member, said stop element being adjustable between:

(i) a third position at which said pawl member is disengaged from the external teeth of said ratachet wheel, thereby freeing said ratchet wheel for rotation in either direction;

(ii) a second position at which said pawl member is engaged with the external teeth of said ratchet wheel in a manner such as to prevent said ratchet wheel from rotation in either direction; and

(iii) a first position at which said pawl member is engaged with the external teeth of said ratchet wheel in a manner such as to allow said ratchet wheel to rotate in response to a retraction of said belt, the said pawl member being movable bodily from said first position through a limited distance to said second position to thereby accommodate limited rotation of said ratchet wheel in response to an extension of said belt;

(m) an electromagnetically operated plunger device for adjusting said stop element between said first, second and third positions; and

(n) a projection on said clutch disc arranged to engage said stop element during retraction of said belt to adjust said stop element to a position allowing said pawl member to disengage from the external teeth of said ratchet wheel.

4,456,197

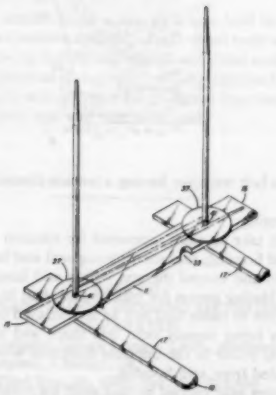
YARN FEEDER

Thomas J. Canetta, 3 Susan St., Cottekill, N.Y. 12419

Filed Sep. 28, 1982, Ser. No. 424,898

Int. Cl.³ B65H *49/02*; D03J *5/08*

U.S. Cl. 242—130.4 **7 Claims**



1. A yarn feeder comprising:

a base plate substantially rectangular in shape with a major axis and a minor axis, said major axis being substantially longer than said minor axis;

a pair of tubes rigidly mounted in said base plate, said tubes having a concentric opening extending through them, each of said tubes extending beyond both opposite sides of said base plate;

a pair of finger-like members, each located on one side of said base plate and each rotatably mounted on one of said tubes, said finger-like members being adapted to fit together to form a rectangular member substantially the same size and shape as said base plate;

a pair of bearings, one of said bearings being located on each of said tubes on the side of said base plate opposite from said pair of finger-like members;

a pair of discs rotatably mounted on said bearings; and

a pair of spindles, each detachable mounted in one of said tubes and extending substantially above said pair of discs.

4,456,198

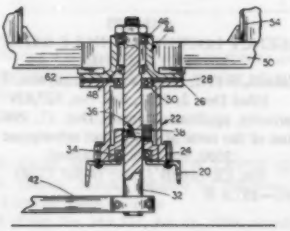
WELDING WIRE DISPENSER

Delmar D. Kosch, 1730 Woodland Dr., Columbus, Nebr. 68601

Filed Sep. 19, 1983, Ser. No. 533,217

Int. Cl.³ B65H *59/04*

U.S. Cl. 242—156.2 **1 Claim**



1. A welding wire dispenser for dispensing wire to a wire feeder,

a support means,

a hub means mounted on said support means and extending upwardly therefrom, said hub means having a horizontally disposed annular portion at its upper end,

a vertically disposed and vertically movable shaft rotatably mounted in said support means and extending upwardly therefrom through said hub means,

a coil support means rotatably mounted on the upper end of said shaft above said hub means and vertically movable with said shaft, said coil support means having a horizontally disposed annular portion at its lower end adapted to frictionally engage said annular portion on said hub means to limit the rotation of said coil support means when said annular portions are in frictional engagement with each other, said coil support means adapted to support a coil of welding wire thereon,

an arm means having horizontally disposed lower end portion secured to said shaft and an upper end portion disposed laterally of the coil of wire on the coil support means,

a pulley rotatably mounted about a vertical axis on the upper end portion of said arm means adapted to have the welding wire on the coil extending therearound,

a helical cam means in said hub means extending around at least a portion of said shaft,

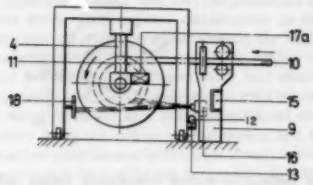
and a cam follower mounted on said shaft in engagement with said cam means whereby said cam follower will travel upwardly on said cam means thereby vertically moving said shaft so that said annular portions will not be in frictional engagement with each other so that said coil support means may freely rotate when said arm means is moved towards the wire feeder.

4,456,199

WINDING MACHINE FOR WINDING STRAND-SHAPED WINDING MATERIAL ON A SPOOL

Gerhard Seibert, Putzendoplergasse 3, Vienna A-1232, Austria A-1232

Filed Jun. 22, 1981, Ser. No. 276,288
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024095
Int. Cl.³ B65H 54/28
U.S. Cl. 242—158 R 8 Claims



1. In a winding machine for winding strand-shaped winding material on a spool to which the winding material is fed via a strand guide, having a feed drive for a reciprocating relative traversing movment of the spool and the strand guide along each other and having a control device for maintaining a constant run-on angle of the winding material running onto the spool for accurately laying turns of the winding material within each winding layer, the control device including a first and a second measurement means for detecting, respectively, locating of the winding material and instantaneous traversing position of said spool relative to said strand guide, the improvement wherein

said first measurement means detects a position of a last-wound turn at a measurement point which is at a predetermined angle of rotation of the spool in front of a run-on point of the winding material onto the spool, and said control device further comprises

computer means for receiving measurement values from said first and second measurement means and for calculating a relative position which said spool and said strand guide must reach after rotation of said spool by said predetermined angle of rotation of the spool in order to maintain said run-on angle and for commanding said relative position from the feed drive.

4,456,200

PNEUMATIC MONITORING SYSTEM FOR A MAGNETIC TAPE DRIVE

Robert M. Ariniello, Boulder, Colo., assignor to Storage Technology Corporation, Louisville, Colo.

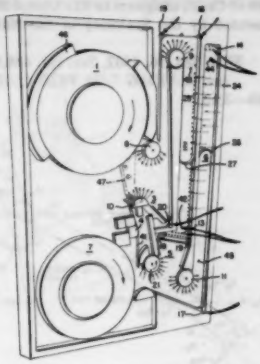
Filed Jul. 6, 1982, Ser. No. 395,606
Int. Cl.³ G11B 15/28, 15/46, 15/58, 19/28
U.S. Cl. 242—185 12 Claims

1. A pneumatic monitoring system for a magnetic tape drive in which vacuum and pressure control the movement of magnetic tape in said drive comprising:

a pressure bus coupled to a plurality of points in said tape drive at which pressure controls the movement of said magnetic tape;

a vacuum bus coupled to a plurality of points in said tape drive at which vacuum controls the movement of said magnetic tape;

a sensor connected to said pressure and to said vacuum bus, said sensor producing a signal proportional to the levels of vacuum and pressure present at said points; and



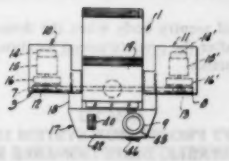
means for comparing said signal to preset ranges for calibrated conditions of said tape drive, said means indicating an error condition if said signal is outside of said ranges.

4,456,201

REEL-TO-REEL DRIVE SYSTEM

Ronald J. Frias, Milwaukee, and David Jagielski, Kewaskum, both of Wis., assignors to Micron Corporation, Iron Ridge, Wis.

Filed Nov. 1, 1982, Ser. No. 438,378
Int. Cl.³ G03B 1/04; G11B 15/32
U.S. Cl. 242—203 21 Claims

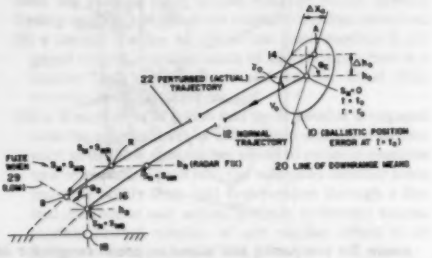


1. A multiple speed drive apparatus for transfer of a strip from one reel to another reel and the like, comprising output shaft means for mounting of first and second reel drive members in spaced relation for transfer of the strip therebetween, a separate drive system for each of said output shaft means, each of said drive system being correspondingly constructed and each including a fast drive motor and a separate slow drive motor, a speed reduction train connected between said slow drive motor and the corresponding output shaft means, said train including first and second speed reduction stages connected in series and including a first stage output element and a second stage input element, and a first one-way clutch means connecting said input element of said second stage to said output element of the first stage, said one-way clutch means providing transfer of power from said first stage to said second stage and automatically decoupling of said second stage from said first stage in response to positive driving of the input element of the second stage.

4,456,202
BURST HEIGHT COMPENSATION

Donald A. Price, Jr., Palo Alto, and Charles A. Louis, III, San Jose, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sep. 16, 1982, Ser. No. 418,895
Int. Cl.³ F41G 7/00; F42B 15/02
U.S. Cl. 244—3.15 **4 Claims**



1. A method of increasing the predictable effectiveness of a ballistic reentry body having a predicted nominal reentry trajectory, which comprises the steps of:

(a) determining when said reentry body reaches a predetermined location on its nominal trajectory;

(b) continually determining the distance travelled by said reentry body after said reentry body reaches said predetermined location;

(c) periodically measuring the altitude of said reentry body to determine when said reentry body reaches a predetermined altitude;

(d) determining an assumed actual trajectory by comparing the determined distance travelled to the predetermined altitude by said reentry body with the nominal distance travelled to said predetermined altitude by said reentry body from predetermined location on the nominal trajectory;

(e) calculating the distance as determined in step (b) to a selected burst location for the assumed actual trajectory; and

(f) fuzing said reentry body when the determined distance travelled after the predetermined location equals the calculated distance.

4,456,203
AIRCRAFT PROPULSION SYSTEM HAVING A TRANSLATABLE, DIRECTIONABLE EXHAUST NOZZLE

John D. Louthan, Dallas, Tex., assignor to LTV Aerospace and Defense Company, Dallas, Tex.

Filed Aug. 2, 1982, Ser. No. 403,957
Int. Cl.³ B64C 15/02; B64D 30/04
U.S. Cl. 244—23 D **25 Claims**

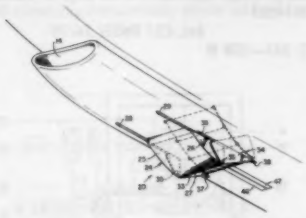
1. A VSTOL aircraft propulsion system comprising:

aircraft structure defining a passageway having an inlet and an outlet, further comprising propulsive means mounted in the passageway for generating propulsive flow through the passageway, the passageway defining an exhaust duct communicating between the propulsive means and the passageway outlet and extending rearwardly from the engine means;

exhaust deflection means extending within the exhaust duct, the exhaust deflection means having a portion which is pivotally movable relative to the aircraft structure;

a translatable guide structure, and means, movably mounting the guide structure of the aircraft structure adjacent the passageway outlet, for permitting translation of the guide structure between a forward positional extreme, and an aft positional extreme in which the guide structure is in alignment with at least a portion of the passageway outlet;

linkage means, interconnecting the guide structure and the exhaust deflection means, for translating pivotal movement of the exhaust deflection means into translational movement of the guide structure, the guide structure and



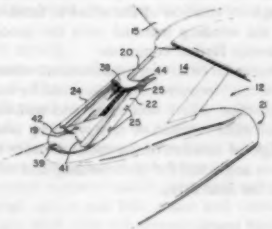
exhaust deflection means comprising means defining a directionable exhaust nozzle communicating with the exhaust duct, and

means for positioning the guide structure and the movable portion of the exhaust deflection means, for directioning the exhaust nozzle formed between the guide structure and the movable portion of the exhaust deflection means.

4,456,204
DEPLOYABLE INLET FOR AEROPLANE CENTER BOOST ENGINE

Donald W. Hapke, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1981, Ser. No. 306,748
Int. Cl.³ B64D 33/02
U.S. Cl. 244—53 B **14 Claims**



1. In combination with an aircraft having a fuselage; an empennage including an empennage body structure and an upstanding vertical stabilizer mounted on said fuselage and having a leading edge and spaced port and starboard skin panels defining smooth, aerodynamically streamlined skin surfaces extending rearwardly from said stabilizer leading edge; and of the type including an auxiliary center boost jet engine having a rearwardly directed exhaust nozzle mounted within said empennage body structure, an air inlet formed in and coincident with said leading edge of said stabilizer, and an air inlet duct extending from said air inlet to said center boost jet engine and being enclosed wholly within said vertical stabilizer and said empennage body structure; a deployable air inlet comprising:

(a) port and starboard air inlet closure members respectively formed by lower leading edge quarter chord door panels defining portions of said port and starboard aerodynamically streamlined skin surfaces of said stabilizer;

(b) said port and starboard air inlet closure members defining a forwardly presented generally vertical parting line coincident with said stabilizer leading edge with said members

respectively lying in the planes of said stabilizer port and starboard skin surfaces when in the closed position so as to form smooth aerodynamically streamlined continuations of said port and starboard stabilizer skin surfaces extending rearwardly from said stabilizer leading edge;

(c) said port and starboard closure members having their rearmost generally vertical quarter chord door panel edges pivotally secured to said stabilizer along lines generally parallel to said stabilizer leading edge and lying in the planes of said port and starboard skin surfaces when in the closed position;

(d) means for rotating said port and starboard closure members about their pivotal connections to said stabilizer between: (i) a first position wherein the leading edges of said closure members are in abutting sealing relation along said parting line coincident with said stabilizer leading edge so as to close and seal said air inlet when said aircraft is being operated in a cruise operational mode and said center boost jet engine is shut down; and (ii), a second position wherein said port and starboard closure members are pivoted outwardly and in opposite directions from said parting line coincident with said stabilizer leading edge so as to define said air inlet's highlight and throat geometry during power assist operational modes of the aircraft when said center boost jet engine is operational;

(e) said port and starboard closure members being spaced above the juncture between said vertical stabilizer and said fuselage; and,

(f) means for precluding entry of fuselage boundary layer air into said air inlet when said port and starboard closure members are in said second position.

4,456,205

AIRCRAFT ARRESTING GEAR NET RAISING DEVICE

Jacques J. Alavoine, Domont; Claude Contensou, Paris; Pierre M. Hardy, Courbevoie, and Francis H. Neveux, Chatillon, all of France, assignors to Aerazur EFA, France

Continuation-in-part of Ser. No. 176,429, Aug. 8, 1980, abandoned. This application Jan. 3, 1983, Ser. No. 455,077

Claims priority, application France, Aug. 9, 1979, 79 20397

Int. Cl.³ B64F *1/02*

U.S. Cl. 244—110 C **1 Claim**

1. An aircraft arresting gear, for disposal across a runway having a center line, comprising:

(a) a pair of frame structures having a first end and a second end, said frame structures being disposed on the ground one at each side of the runway and obliquely to the center line of the runway,

(b) anchoring means associated with said frame structures for the anchoring thereof to the ground,

(c) a pair of posts, one secured to each of said frame structures, said posts each having a top end and a bottom end, and pivot means pivoting each post at its bottom end, said pivot means being offset in relation to the longitudinal axis of the associated post,

(d) a rope connected to the top end of each post and disposed across the runway,

(e) a net disposed across the runway and connected to said rope,

(f) a pair of piston and cylinder rams associated one with each of said frame structures, the piston rod of each said ram being secured to the associated frame structure,

(g) push links pivotally connected at one end to the ram cylinder and at the opposite end to the associated post,

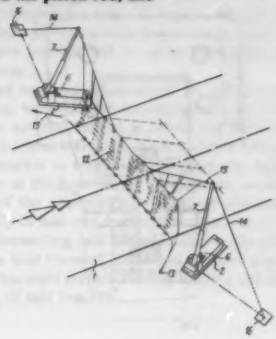
(h) guiding tracks provided on each frame structure for guiding the movement of the associated ram cylinder,

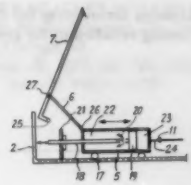
(i) a first circuit connecting a chamber of the ram cylinder located around the piston rod to means for feeding one of hydraulic and pneumatic fluid,

(j) a raising solenoid valve disposed on said first circuit to control the feeding of said cylinder chamber located around the piston rod,

(k) a second circuit connecting said cylinder chamber located around the piston rod to an emptying tank,

(l) a lowering solenoid valve disposed on said second circuit to control the emptying of said cylinder chamber located around the piston rod, and





(m) a closed chamber of the ram cylinder, opposite said chamber located around the piston rod, said closed chamber being equipped with a valve adjusted to hold at an invariable value the pressure within said closed chamber, thus avoiding a lowering of the upper portion of the net involved by a non-elastic deformation of suspension members.

4,456,206

FASTENING DEVICES FOR ATTACHING OF BUILT-IN ELEMENTS

Hartmut Tijssen, Fredenbeck, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm Gesellschaft m.b.H., Munich, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 385,279

Claims priority, application Fed. Rep. of Germany, Jun. 5, 1981, 3122366

Int. Cl.³ B64D *11/00*

U.S. Cl. 244—118.5 **15 Claims**

1. A fastening provision for attachment of built-in elements comprising

built-in elements for providing space separation means;

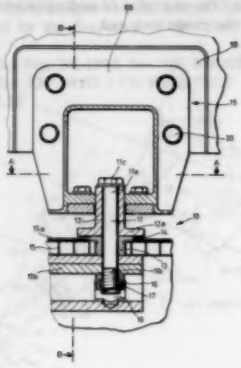
a support structure having a connection bore opening;

a sealing element disposed about the connection bore opening; and

connecting elements combined in such a way that the built-in elements can be adjusted in the x-, y-, and z-directions and including

a bushing disposed in the bore opening and contacting the sealing element;

a bolt providing a support and/or distance element having its thread guided by the bushing;



a spacer guide collar surrounding the shank of the bolt; and a support mounting attached to the collar.

4,456,207

TURNING A PALLET OR CONTAINER

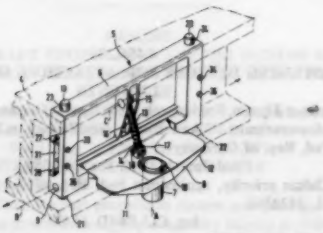
Hinrich Engel, Bremen; Eckhard Koch, Lilienthal, and Günther Vogg, Bremen, all of Fed. Rep. of Germany, assignors to MBB/VFW GmbH, Bremen, Fed. Rep. of Germany

Filed Jan. 13, 1982, Ser. No. 339,128

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1981, 3102146

Int. Cl.³ B64C *1/22*

U.S. Cl. 244—137 R 12 Claims



1. A system for forced turning of pallets, containers, or the like, inside the cargo space of an aircraft, there being a floor construction in the aircraft, the combination comprising:

a pivot pin extending upward from the floor construction;

an accessory member being fastened to a pallet or container and having a fold-down trap plate with a bore;

so that upon engagement of the pin in the bore of the trap plate, the pallet or container is forced to pivot about the pin, thereby changing its direction of movement during loading and unloading of the aircraft.

4,456,208

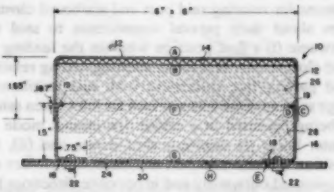
SHELL TILE THERMAL PROTECTION SYSTEM

Ian O. MacConochie, Yorktown; Ashby G. Lawson, Tabb, and H. Neale Kelly, Yorktown, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 20, 1982, Ser. No. 435,511

Int. Cl.³ B64G *1/58*

U.S. Cl. 244—158 A 5 Claims



4. A shell tile adapted for use as a component part of a reusable, externally applied thermal protection system on the skin of aerospace vehicles and the like comprising:

upper and lower metallic shells for assuming structural loads,

each of said upper and said lower shell having a base and side portions,

said lower shell base being attached to the vehicle skin and said upper shell being disposed opposite and joined at the side portion thereof to said lower shell, defining an interior cavity therebetween;

insulating means interposed in said interior cavity;

connecting means for attaching said lower shell base to the vehicle skin while permitting some relative movement therebetween;

said connecting means including a floating nut plate integral with the vehicle skin, and bolting means integral with said lower shell for directly connecting said lower shell to the vehicle skin.

4,456,209

DEVICE FOR SELECTIVELY SECURING AN OBJECT TO A SHAFT

Fernand Calizano, Groslay, and Michel Chauvel, Chatenay Malabry, both of France, assignors to Compagnie Internationale pour l'Informatique CII Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 8, 1981, Ser. No. 328,634

Claims priority, application France, Dec. 24, 1980, 8027419

Int. Cl.³ B65H *19/02;* B23B *5/22, 31/40*

U.S. Cl. 242—68.1 6 Claims

1. A device for releasably securing an object to a shaft having an axis and driven by a motor mounted on a support plate, said object being provided with a central recess so that when the object is secured the central recess turns about the axis, said device comprising:

a hub coaxial with the axis and secured to said shaft,

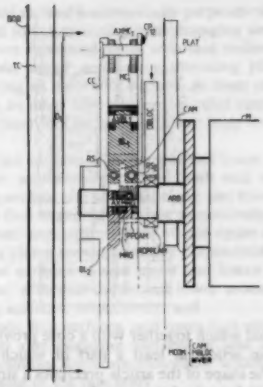
a plurality of frictional engagement shoes mounted on said hub, at least one of said shoes being movable radially relative to the axis, said shoes being annularly disposed on said hub and facing said recess to lock said object when each movable shoe is at a locked position where it is in frictional engagement with a wall of said central recess and to unlock said object when each movable shoe is at an unlocked position,

a sleeve fitted loosely over said shaft and provided with a cam having a contour coacting with each movable shoe such that relative rotary movement of said shaft and of said sleeve causes radial movement of each movable shoe,

said cam being located placed relative to said hub such that each movable shoe is in an unlocked position,

first detecting means mounted on said hub and on said support plate and arranged to derive a first signal causing the motor to be temporarily stopped in response to said hub being at a first predetermined rotational position,

immobilizing means mounted on said sleeve and on said support plate and responsive to said first signal for immobilizing said sleeve and said cam in response to said hub being at said first rotational position so that said cam causes each movable shoe to be moved towards the locked



position thereof in response to said motor being again activated, and

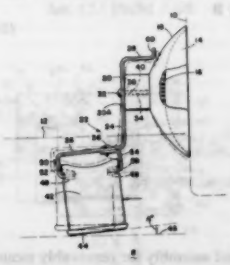
second detecting means mounted on said hub and on said support plate and arranged to derive a second signal in response to said hub being at a second predetermined rotational position where each movable shoe is driven to a locking position therefor by said cam, said second signal causing the motor to be temporarily stopped, said immobilizing means being further responsive to said second signal for releasing said sleeve and said cam when said motor has been stopped in response to said second signal.

4,456,210

TRANSDUCER MOUNTING

William E. McBride, Tulsa, Okla., assignor to Lowrance Electronics, Inc., Tulsa, Okla.

Filed Aug. 12, 1982, Ser. No. 407,455
Int. Cl.³ F16B *47/00*
U.S. Cl. 248—205.5 **10 Claims**



1. Apparatus for mounting a transducer to the rearward surface of the transom of a boat floated on water, comprising:

a suction cup of resilient material having a convex rearward surface and a concave forward surface, the cup being deformable whereby the concaved surface when pressed against a boat transom rearward surface creates a vacuum to thereby retain the cup in engagement with the boat transom, the suction cup having an integral rearwardly extending boss portion;

a bracket having a vertical portion affixed to said suction cup boss portion and having a lower, rearwardly extending arm portion and an upper forwardly extending arm portion;

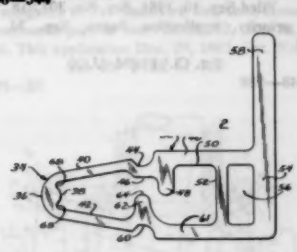
means of securing a transducer to said bracket lower arm portion whereby the transducer is supported so that the lower surface thereof is below the surface of water on which a boat is floated, the transducer being supported by the bracket to resist the force of water against the transducer as the boat moves through the water, the forward end of the upper arm terminating adjacent to and rearwardly of said cup rearward surface, the resiliency of said cup permitting said bracket to pivotally displace relative to the boat transom, said bracket upper arm engaging said cup rearward surface thereby limiting the degree of pivotation of said bracket.

4,456,211

SHELF BRACKET RETAINER

Stephen G. Wyckoff, Mount Prospect, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Aug. 31, 1981, Ser. No. 298,031
Int. Cl.³ F16M *13/00*
U.S. Cl. 248—544 **7 Claims**



1. A shelf bracket retainer of unitary resilient plastic construction comprising an entering nose portion having diverging top and bottom walls, each of said walls having an exterior indentation for receiving confronting edges of a shelf bracket, at least one of said walls having an inwardly directed protuberance opposite to the corresponding indentation and providing a surface for engagement for engaging the edge of a shelf bracket.

4,456,212

HEIGHT ADJUSTABLE FURNITURE SUPPORT

William B. Raftery, Arlington, Tex., assignor to Steelcase, Inc., Grand Rapids, Mich.

Filed Feb. 14, 1983, Ser. No. 466,154
Int. Cl.³ F16M *11/24*
U.S. Cl. 248—558 **8 Claims**

1. A height adjustable furniture support comprising:

(a) a column having a lower base end and a free upper end;

(b) a reversible collar mounted on the free upper end in either a first or second position; and

(c) a support plate securable to the reversible collar;

(d) the reversible collar further comprising:

(i) first and second ends;

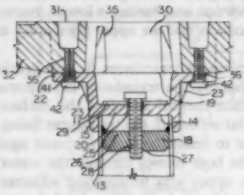
(ii) a substantially horizontal load bearing seat positioned between the first and second ends, either side of the seat being adapted to fit onto the free end of the column; and

(iii) an external flange substantially parallel to the seat;

(e) means for securing the collar to the column in either the first or second position;

(f) the support plate having an opening adapted to receive one end of the collar but not the flange;

(g) means for securing the flange to the support plate with the collar in either the first or second position; and



(h) the seat and the flange cooperating respectively with the column and the support plate to provide, with the reversible collar in the first position, a furniture support of a first pre-selected height and in the second position to provide a furniture support of a second pre-selected height.

4,456,213

ENGINE MOUNTING STRUCTURE

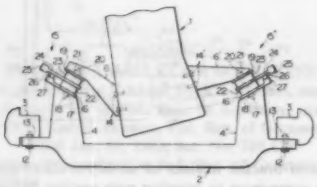
Masao Fukushima, Fuchu, and Komei Yazaki, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Sep. 10, 1981, Ser. No. 301,018

Claims priority, application Japan, Sep. 24, 1980, 55-135710[U]

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—559 **7 Claims**



1. An engine mounting structure for mounting an automotive engine on the body structure of an automotice vehicle, comprising at least one shock and vibration insulating unit which comprises:

a first coupling member to be connected to the body structure of the vehicle;

a second coupling member to be connected to the body structure of the engine;

a first resilient block securely attached directly to said first coupling member;

a second resilient block securely attached directly to said second coupling member;

each of the first and second resilient blocks being totally solid;

an intermediate member securely interposed directly between the first and second resilient blocks and extending from between the first and second resilient blocks substantially in parallel with the first and second coupling members, the intermediate member being closely interposed between said first and second resilient blocks throughout its portion intervening between the resilient blocks;

an inertia member carried on said intermediate member at a free end of the intermediate member; and

a third resilient block securely interposed between said intermediate member and one of the first and second coupling members and spaced apart substantially in parallel from said one of the first and second resilient blocks.

4,456,214

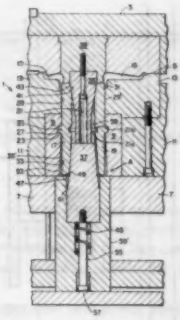
MOLDING APPARATUS WITH POSITIVE COLLAPSE CORE

Wilf Ruck; Brian Russell, both of London, Canada; George L. Roehr, Waltham, and Paul R. Catalanotti, Needham Heights, both of Mass., assignors to Roehr Tool Corporation, Waltham, Mass.

Continuation of Ser. No. 251,279, Apr. 6, 1981, abandoned. This application Dec. 6, 1982, Ser. No. 447,308

Int. Cl.³ B22C *9/24*

U.S. Cl. 249—144 **16 Claims**



1. A mold which together with a core provides a cavity for molding an article at least a part of which is hollow and wherein the shape of the article precludes a straight line longitudinal withdrawal of the core from the molded article, the core comprising separate individual segments, a mount for holding the segments against longitudinal movement in the mount and providing fixed pivot axes for the respective segments so that each may rock about an individual axis between a molding position and a release position, at least two adjacent segments being in contact with each other within the mold cavity when the segments are in the molding position, an actuator for rocking the segments from one of said positions to the other, said actuator initiating the inward rocking of the molding portions of said two adjacent segments sequentially so that the rocking of one of them provides space for the rocking of the other.

4,456,215

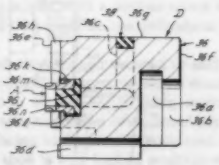
INNER SEAL AND SUPPORT ROD ASSEMBLY FOR HIGH PRESSURE BLOWOUT PREVENTERS

Thomas R. Bishop, and Arnal B. Foreman, Jr., both of Houston, Tex., assignors to Bowen Tools, Inc., Houston, Tex.

Filed May 7, 1982, Ser. No. 375,961

Int. Cl.³ E21B *33/06*

U.S. Cl. 251—1 B **13 Claims**



1. An inner seal assembly for removably mounting within an inner seal opening formed in a ram body of a blowout preventer having a ram bore, comprising:

a resilient sealing material adapted to be mounted with the ram body, said resilient sealing material formed having a ram body engaging surface, upper and lower ram seal

bore engaging surfaces, upper and lower mounting plate foot engaging surfaces, upper and lower mounting plate engaging surfaces, and an inner seal surface, wherein,

said upper and lower ram seal bore engaging surfaces are substantially perpendicular to said ram body engaging surface,

said upper and lower mounting plate foot engaging surfaces are substantially perpendicular to said upper and lower ram seal bore engaging surfaces, respectively,

said upper and lower mounting plate engaging surfaces are substantially perpendicular to said upper and lower mounting plate foot engaging surfaces, respectively, and,

said inner seal surface is substantially perpendicular to said upper and lower mounting plate engaging surfaces;

upper and lower mounting plates with said resilient sealing material, said upper and lower mounting plates each formed having an inner foot surface, an inner seal engaging surface, an inner bore surface, an outer ram engaging surface, an outer foot surface, and a ram body foot surface, wherein

said inner foot surfaces of said upper and lower mounting plates are substantially parallel with said ram body engaging surface and with said upper and lower mounting plate foot engaging surfaces, respectively,

said inner seal engaging surfaces of said upper and lower mounting plates are substantially perpendicular to said inner foot surfaces of said upper and lower mounting plates and with said upper and lower mounting plate engaging surfaces, respectively, and

said ram body foot surfaces, said outer foot surfaces, and said outer ram engaging surfaces of said upper and lower mounting plates are mountable within the inner seal opening of the ram body,

said resilient sealing material and said upper and lower mounting plates are adapted to be retained by the inner seal opening for sealable movement in a direction parallel to the longitudinal axis of the ram body,

said resilient sealing material and said upper and lower mounting plates are removably mounted with the inner seal opening in a direction perpendicular to the longitudinal axis of the ram body solely by the exertion of a lateral force on said resilient sealing material and said upper and lower mounting plates when the ram body, said resilient sealing material, and said upper and lower mounting plates are retracted from the ram bore; and,

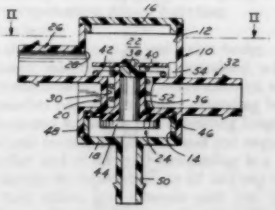
said upper and lower mounting plates enhancing flow of said resilient sealing material upon sealing actuation of the ram body of the blowout preventer.

4,456,216

CARBURETOR FUEL BOWL VENT VALVE ASSEMBLY

Thaddeus Boruta, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jun. 4, 1982, Ser. No. 385,154
Int. Cl.³ F02M *5/08*
U.S. Cl. 251—11 **7 Claims**



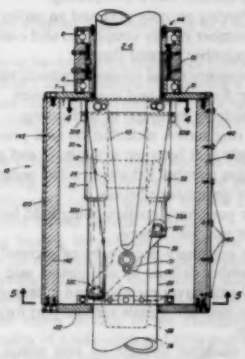
1. A carburetor fuel bowl vent valve assembly comprising a cylindrical housing having a hollow interior defining a fuel vapor chamber, a fuel vapor outlet connected to the chamber through a side wall portion of the housing, a centrally located well open at its upper end to the chamber and extending axially downwardly from the chamber to a closed lower end, a fuel vapor inlet connected to the well through another side wall portion of the housing for the flow of fuel vapors between the inlet and outlet through the well in a zigzag shaped path, and a valve assembly controlling the flow consisting of a disc-type valve overlying the well upper end and movably secured to a plunger projecting through the well, O-ring seal retaining means projecting radially inwardly into the chamber from the housing side wall to define an annular seal retaining enclosure, and an O-ring seal of an outer diameter slightly smaller than that of the enclosure adapted during assembly to be deposited within the enclosure over the plunger in a floating manner in a radial direction whereby the enclosure provides the sole means for lateral confinement of the O-ring seal while providing radial clearance between the O-ring and plunger, assembly of the valve disc to the plunger axially confining the O-ring between the disc and the housing, the valve assembly also including spring means normally biasing the disc valve to an open position, and vacuum operated servo means operable on the opposite end of the plunger to close the valve against the seal preventing communication of vapor between the inlet and outlet.

4,456,217

KELLY VALVING APPARATUS

Mitchell E. Winegeart, and Lawrence Connelly, both of Metairie, La., assignors to Pet Tech-Dril Saf, Inc., Houston, Tex.

Continuation-in-part of Ser. No. 87,732, Oct. 20, 1979, abandoned. This application Dec. 29, 1981, Ser. No. 335,327
Int. Cl.³ F16K *31/122*
U.S. Cl. 251—58 **10 Claims**



1. A kelly valving apparatus for controlling flow of fluid through a kelly and drill string comprising:

a. a rotatable tubular section having a fluid conveying bore adapted to be attached to the drill string at the kelly;

b. valve means associated with said valve body for valving the flow of fluids through the bore;

c. remotely operable operator means rotatable with the rotatable tubular section, operably engaging the valve means for moving the valve means between positions which open and close the bore, the operator means including at least:

i. one hydraulic cylinder having an extensible ram actuated by hydraulic fluid;

ii. linkage means connecting the valve means and hydraulic cylinder so that extension/contraction of the ram effects an opening or closure of the bore;

d. a liquid interface fluid collector ring means positioned adjacent the rotatable tubular section for transmitting

pressurized hydraulic fluid to the hydraulic cylinder, so that opening and closing of the valve means can occur during spinning of the cylinder, the tubular section, the collector ring means and the linkage means;

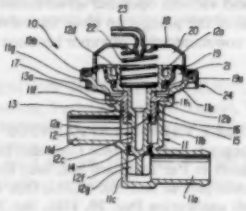
e. a source of controllable pressurized hydraulic fluid connectable to said fluid collector ring means for supplying pressurized hydraulic fluid thereto.

4,456,218

FLUID CONTROL VALVE

Yasuhiro Kawabata, Anjo, and Kongo Aoki, Kariya, both of Japan, assignors to Aisan Seiki Kabushiki Kaisha, Kariya, Japan

Continuation of Ser. No. 230,259, Jan. 30, 1981, abandoned. This application Feb. 18, 1983, Ser. No. 467,743
Claims priority, application Japan, Jan. 30, 1980, 55-011058
Int. Cl.³ F16K 31/365
U.S. Cl. 251—61.5 1 Claim



1. A fluid control valve comprising:

a casing having an inlet port and an outlet port,

a cover member rigidly coupled to said casing and including a port member formed therein,

vacuum pressure signal means communicating with said port member formed in said cover member;

a piston slidably mounted in said casing,

first seal ring means mounted on said piston for providing fluid-tight seal between said piston and said casing,

a diaphragm member having an outer periphery portion and an inner periphery portion,

said outer periphery portion being held between said cover member and said casing,

said inner periphery portion being secured to said piston,

a first chamber defined by said piston, said diaphragm member and said cover member, and communicating with said vacuum pressure signals via said port formed in said cover member,

a second chamber defined by said piston, said diaphragm member and said first seal ring means, and in constant communication with atmospheric pressure,

spring means positioned between said cover member and said piston for urging said piston in one axial direction thereof, and

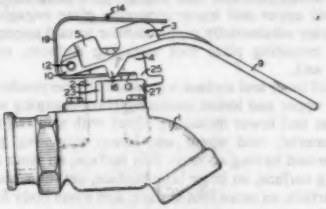
second seal ring means mounted on said piston in fluid-tight sliding engagement with said casing so as to be disengaged therefrom upon axial movement of said piston wherein said first seal ring means further comprises a guide member mounted within said casing, a first seal ring member fluid-tightly mounted between said guide member and said piston and a second seal ring member fluid-tightly mounted between said guide member and said casing and wherein said guide member further comprises a flange portion and said casing further comprises a shoulder portion and an inner groove portion, and further comprising a snap ring positioned in said inner groove portion such that said flange portion is held between said shoulder portion and said snap ring.

4,456,219

SPRING-LOCKING HANDLE MECHANISM

Daniel G. Scott, Swissvale, and Gene S. Ferry, McKeesport, both of Pa., assignors to American Standard Inc., Wilmerding, Pa.

Filed Aug. 29, 1983, Ser. No. 527,047
Int. Cl.³ F16K 35/02, 31/60
U.S. Cl. 251—99 26 Claims



1. For use with a locking-type handle including a socket portion and a handle portion connected to said socket portion connected to control means so that said handle portion is rotatable relative to said socket portion in a first plane of rotation between a locked and an unlocked position, and rotatable with said socket portion in a second plane of rotation between an open and a closed position to effect operation of said control means following operation of said handle portion in said first plane of rotation to said unlocked position, a flat spring having a generally U-shaped configuration comprising:

(a) a first leg bearing against the underside of said socket portion; and

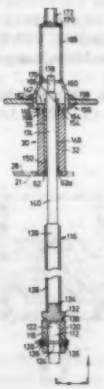
(b) a second leg overlying the socket portion and bearing against the upper side of said handle portion so as to exert a yieldable force thereon twoward said locked position, said force increasing with operation of said handle portion toward said unlocked position.

4,456,220

NOZZLE ASSEMBLY FOR TOP OPERATING ROD

Gunter R. Beble, St. Peters, and Joel A. Mingus, St. Charles, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

Filed Jun. 1, 1981, Ser. No. 268,969
Int. Cl.³ F16K 51/00
U.S. Cl. 251—144 10 Claims



1. In a tank assembly including an operating rod attached to the bottom outlet valve and passing through a tank body, through a threaded guide, and through a nozzle assembly

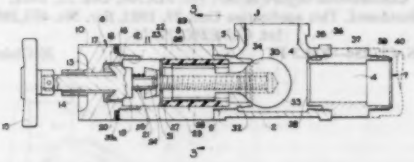
including a hollow cylindrical housing for the operating rod extending only partially into said tank body; and means for sealing the operating rod relative to the tank, the improvement comprising: a sleeve located within said housing; said operating rod extending through said sleeve; means for preventing said sleeve from rotating during rotation of the operating rod; said sleeve having a sufficiently low coefficient of friction with metal to allow the operating rod to easily rotate relative to the sleeve; and said sleeve having a sufficient shear strength to withstand loads applied by rotation of the operating rod to the nozzle assembly, and sufficient strength in compression to react bending moments applied to the nozzle assemlby resulting from misalignment of the lading valve realtive to the nozzle assembly.

4,456,221

TWO PIECE BALL VALVE ASSEMBLY

Declan R. Bryant, 480 W. Sharon Rd., Cincinnati, Ohio 45246

Filed Dec. 10, 1981, Ser. No. 329,406
Int. Cl.³ F16L *37/00*; F16K *31/44*
U.S. Cl. 251—152 **12 Claims**



1. A ball valve assembly kit adapted to be coupled with a hollow pipe joint of the type having an inlet, an outlet spaced from said inlet, and an opening positioned intermediate said inlet and outlet, said valve assembly kit comprising:

a valve actuator assembly having a spherical shaped valve element, means for linearly reciprocating said valve element and means capable of coupling said actuator assembly to the pipe joint such that when said valve actuator is coupled to a pipe joint, said valve element is reciprocable within the pipe joint; and

a seat assembly having a generally round seating surface configured to engage said valve element to provide a fluid tight seal therebetween and means capable of coupling said seat assembly to the pipe joint such that said seating surface lies within the joint in alignment with the valve element so that when the valve actuator assembly and seat assembly are assembled to the joint, said valve element may be linearly moved by said reciprocating means between a closed position wherein the valve elements sealingly engages the seating surface to prevent fluid flow between the joint inlet and outlet, and an opened position wherein said valve element is displaced from the seating surface to permit fluid flow between the pipe joint inlet and outlet, wherein said seat assembly includes means adapted to extend outside of said pipe joint for connecting the seat assembly to a second pipe, coupling or the like, said linear reciprocating means including

a hollow valve body;

a cap means closing one end of said valve body;

a linear actuator member slidably restrained within said valve body and attached to said valve element, said linear actuator member bearing an axially extending bore; and

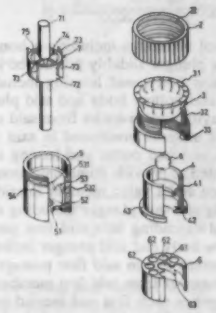
a rotatably mounted actuating rod extending longitudinally within said cap means, one end of said rod engaging said bore, the other end of said rod terminating in a manually graspable handle located exteriorly of said cap means for operating said valve, and wherein said rod includes a coaxial plug, said plug having an outwardly directed circular recess member, said cap includes a central opening through which said actuating rod extends, said central opening including an inwardly directed circular seating surface projection which mates with said outwardly directed circular recess member to prevent passage of fluid around said rod and through said cap.

4,456,222

MECHANISM FOR WATER VALVE

Chung-Shan Shen, No. 34, Ho-Ping Rd., Hu Wei, Yunlin Hsien, Taiwan

Filed Mar. 7, 1983, Ser. No. 473,056
Int. Cl.³ F16K *31/52*
U.S. Cl. 251—230 **5 Claims**



1. A water faucet adapted to be connected to a water supply pipe comprising:

a soft elastic sleeve having on the inner wall thereof an upper flanged ring and a lower flanged ring having a slanted top surface toward the center to define a valve seat;

a ball placed within the sleeve for removable blocking the valve seat;

a clamping tube comprising an upper section shaped into a claw tube having a top end larger than the lower end, a mid-section threaded on the interior surface and a lower section threaded on the interior surface;

a retaining ring having threads on the interior surface to engage those on the mid-section of the clamping tube;

a drain pipe having threads on the exterior surface of the upper end thereof to engage those provided on the interior surface of the lower section of the clamping tube and having a plurality of guide teeth and slots provided on the interior surface on the lower end thereof;

a cover block disposed within the drain pipe and below the sleeve and comprising a hollow cylinder having the upper end thereof covered by a plate having a central opening surrounded by a plurality of openings and an open lower end, the interior surface of the cover block being provided with a plurality of depressions;

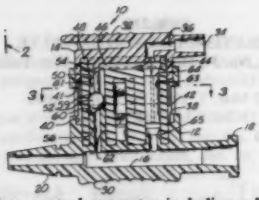
an operating lever comprising a cylinder having the upper end thereof protruding through the central hole in the cover block and the lower end extending out the drain pipe, a rotating tube being attached to an intermediate section of the cylinder, the rotating tube having blocks circumferentially attached so that when the operating lever is raised and then lowered, the blocks on the rotating tube are guided by the depressions on the cover block and the guide teeth on the drain pipe to maintain the operating lever in consecutive raised and lowered positions to move the ball away from the valve seat in the sleeve and permit the ball to block the valve seat, respectively, thus opening and closing the faucet.

4,456,223

FLOW CONTROL APPARATUS

Wendell V. Ehling, Placentia, Calif., assignor to Bentley Laboratories, Inc., Irvine, Calif.

Filed Dec. 3, 1981, Ser. No. 327,111
Int. Cl.³ F16K *31/524*
U.S. Cl. 251—342 **8 Claims**



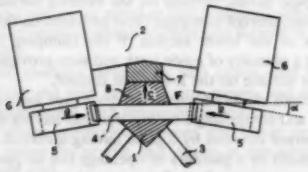
1. A flow control apparatus including a housing having a hollow body and a plunger slidably positioned in and extending from said hollow body, said housing including a central cavity defined by said hollow body and said plunger, an inlet into said central cavity and an outlet from said central cavity; a block of resilient material positioned in said central cavity between said inlet and said outlet and having a first passage therethrough oriented to provide communication between said inlet and said outlet; and a valve member in said passage, one of said hollow body and said plunger including a first member affixed thereto and extending into said first passage and the other of said hollow body and said plunger including a second member affixed thereto and in said first passage on the other side of said valve member from said first member, wherein the improvement comprises each first and second members being constructed and arranged to extend to and displace said valve member against one side of said first passage when said hollow body and said plunger are compressed toward one another against said resilient material.

4,456,224

JACKING MECHANISM FOR SELF-RAISING OCEAN PLATFORMS

Jean F. Havard, Carquefou, France, assignor to Brissonneau et Lotz Marine, Carquefou-Nantes, France

Filed Jan. 15, 1982, Ser. No. 339,738
Int. Cl.³ B66F *7/12*
U.S. Cl. 254—89 R **7 Claims**



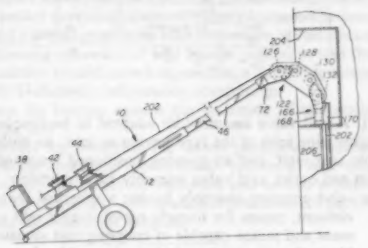
1. In a jacking mechanism of the rack and pinion type which is intended to permit vertical adjustment of the position of an ocean platform and to maintain said platform in an appropriate position upon multiple platform legs, with at least one double rack containing opposite sets of teeth being firmly attached to each platform leg, said rack being accompanied by a jacking mechanism including at least one pair of pinions rotatably supported on the platform structure by means of a frame, with each of said pinions respectively meshing with one of the two sets of teeth located upon the said rack, in such a manner that said teeth shall be situated on either side of said rack, with the pinions being capable of turning by means of drive mechanisms and reducing mechanisms in order to provide necessary movements in one direction or another; said jacking mechanism being characterized by the improvement wherein the said rack contains sets of obliquely cut teeth, and there is provided rigid component means forming lateral thrust-block means integrally attached to the said frame and being disposed between the platform structure and each platform leg, said pinions being angulated with respect to the associated rack so that they exert forces on the rack with a component tending to press one portion of the platform leg against the thrust-block means, consequently providing constant positioning of the pinion teeth in relation to the sets of teeth situated upon the said rack.

4,456,225

CABLE PULLING APPARATUS

Floyd Lucas, 6511 Culmore, Houston, Tex. 77017

Continuation-in-part of Ser. No. 313,768, Oct. 22, 1981, abandoned. This application Dec. 27, 1982, Ser. No. 453,280
Int. Cl.³ E21C *29/16*
U.S. Cl. 254—134.3 FT **20 Claims**



1. A portable powered apparatus for pulling electric cable through conduits in buildings comprising, as an assembly for use in combination,

a supporting frame comprising a first elongated hollow tubular member,

at least one capstan positioned on said frame,

motor means supported on said frame and operatively connected to said capstan for driving the same,

a second hollow tubular member having an exterior size and shape fitting the interior of said first tubular member and positioned for telescopic movement therein,

at least one angle turning pulley bracket for directing a pull line around a substantial angular turn,

said bracket comprising a bracket frame,

at least three pulleys supported in said bracket frame non-linearly to permit a line being pulled to make a substantial turn in at least three separate small angular turns not in excess of about 30°–35° each,

a first yoke pivotally supported on one end of said bracket frame and including a female tubular connector having an interior size and shape operable to fit removably over the end of said second tubular member,

a second yoke pivotally supported on the other end of said bracket frame and including a male tubular connector of the same exterior size and shape as said second tubular member, and

means to secure said first and said second yokes in selected angular relation to said bracket frame,

whereby a line may be pulled by powered operation of said capstan around a substantial angle as directed by the pulleys of said angle turning bracket.

4,456,226

TRACTION DEVICE

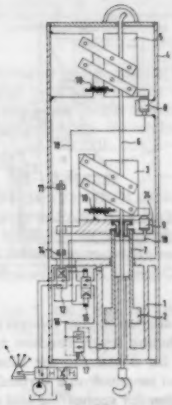
Fritz Stumpmeier, In den Birken 47, D-5600 Wuppertal, Fed. Rep. of Germany

Filed Sep. 17, 1981, Ser. No. 303,120

Claims priority, application Fed. Rep. of Germany, Sep. 25, 1980, 3036214

Int. Cl.³ B65H *3/18*

U.S. Cl. 254—264 **24 Claims**



1. A traction device for causing stepwise relative displacement between the device and an elongate member, the device comprising:

(a) a stationary clamp and,

(b) a movable clamp which is displaceable by a cylinder and piston unit relative to the stationary clamp in the lengthwise direction of the elongate member,

(c) each of said clamps having a pair of closing jaws for engaging the elongate member,

(d) a respective pressure-operated jaw opening device being provided for each clamp for opening the jaws of the clamp to release the elongate member, said stationary clamp having a first jaw opening device and said moveable clamp having a second jaw opening device, each of said jaw opening devices having a two way valve therein for blocking the flow of pressure medium when its respective clamp is closed, and permitting the flow of pressure medium when its respective clamp is opened,

(e) a first control valve having a first and second state which supplies pressure medium alternately to the first and second jaw opening devices, the state of the first control valve being selected by the movement of the cylinder and piston unit,

(f) the stroke direction of the cylinder and piston unit being controlled by a second control valve, said second control valve having a first and a second state with the state of the second control valve also being selected by the pressure medium passing through the two way valves in the jaw opening devices.

4,456,227

DUAL-HANDLED WINCH

Leo J. Notenboom, King County, Wash., assignor to Genie Industries, Inc., Redmond, Wash.

Filed Mar. 23, 1982, Ser. No. 360,837

Int. Cl.³ B66D *1/04, 1/54*

U.S. Cl. 254—350 **8 Claims**

1. A winch comprising:

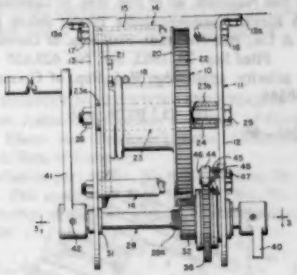
a frame;

a winch drum journal-mounted on the frame and including a ring gear;

a shaft journal-mounted on the frame having hand cranks fixed on its opposite ends and extending in diametrically opposite directions;

a pinion threaded onto said shaft intermediate the ends and meshing with said ring gear, said pinion being axially movable relative to said ring gear by sliding engagement between the meshing teeth of pinion and ring gear in the axial direction;

ratchet means including a ratchet wheel sleeved on said shaft, said ratchet means preventing unwinding of the winch drum when the ratchet wheel is coupled to the pinion; and



means for coupling said ratchet wheel to said pinion and shaft when said pinion moves axially on said shaft toward said pinion responsive to turning of the shaft relative to the pinion in one direction and for uncoupling said ratchet wheel from said pinion and shaft when said pinion moves on said shaft away from said pinion responsive to turning of the shaft relative to the pinion in the opposite direction wherein the ring gear, pinion and ratchet means insures that revolution of the winch drum is controllable while unwinding under load since the pinion will engage the ratchet means as a brake if the winch drum overruns the shaft.

4,456,228

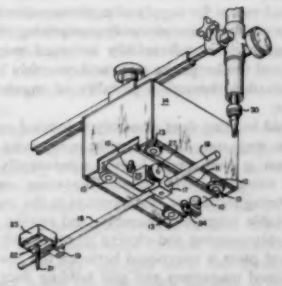
RADIUS ATTACHMENT FOR AUTOMATED WELDING AND CUTTING TORCH CARRIAGES

Harold E. Cable, and Anil N. Rodrigues, both of Pittsburgh, Pa., assignors to Weld Tooling Corporation, Pittsburgh, Pa.

Filed Sep. 29, 1982, Ser. No. 428,258

Int. Cl.³ B23K *7/10*

U.S. Cl. 266—70 **5 Claims**



1. A radius attachment for use with a welding or cutting torch carriage having wheels adapted to engage a guide rail and a drive means normally engaging a drive rack on said rail

comprising a guide rail segment without a drive rack receiving said welding or cutting torch carriage, means on said guide rail segment fixing said torch carriage in position thereon, a pivot means adapted to be fixed on a work piece, means adjustably connecting said rail segment to said pivot means, drive means on said guide rail following a line tangential to the radius of rotation of the guide rail engaged by and driven from the drive means of the torch carriage and balance wheel means on said guide rail segment spaced from the drive means.

4,456,229

PIG-CHARGING APPARATUS FOR A HOT-CHAMBER PRESSURE-DIECASTING MACHINE

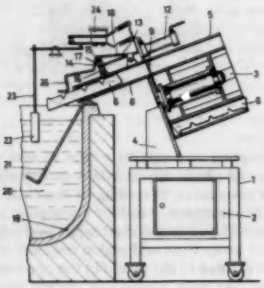
Ernst Bühner, Schmalwasser; Ottmar Zink, and Günter Hahn, both of Bad Neustadt, all of Fed. Rep. of Germany, assignors to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co., Bad Neustadt, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,635

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1981, 3148344

Int. Cl.³ F27B *9/38*

U.S. Cl. 266—95 21 Claims



1. Pig-charging apparatus for a pressure-diecasting machine comprising:

a holding vessel, which can be heated, for receiving a liquid metal melt;

means for supply of pigs to said holding vessel;

a holding duct assembly;

a plate; and

a control system for keeping the liquid metal level in the holding vessel between a lower and an upper level, comprising a switching device which automatically triggers said means for supply of pigs, whereby a pig is charged into the holding vessel when the lower liquid metal level is reached,

wherein said means for supply of pigs comprises an inclined rotatable pig magazine assembly comprising plural parallel elongated, circumferentially arranged magazines, to receive and discharge the pigs, said assembly being capable of rotation through a plurality of angular stopping positions;

wherein said holding duct assembly is located opposite the rotatable magazine, this assembly comprising a holding duct open at both ends, having substantially the same inclined attitude as the rotatable magazine, and one end thereof being located in juxtaposition to the magazines of the rotatable magazine assembly, and release means for controllably opening and closing its other end; and

wherein said plate is interposed between the lower ends of said inclined magazines and said holding duct assembly, and a hold in said plate is provided over the end of the holding duct juxtaposed to said magazines, whereby a pig can slide from one end of the magazines through said hole and into said holding duct.

4,456,230

APPARATUS FOR THE SEPARATION OF METALLIC ZINC FROM RESIDUES CONTAINING ZINC

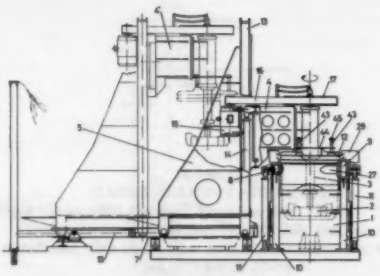
Juan Blas S. Menendez, C/de Poniente No. 3-Urbanizacion Monte Alina, Pozuelo De Alarcon (Madrid-23), Spain

Filed Nov. 3, 1982, Ser. No. 438,744

Claims priority, application Spain, Nov. 13, 1981, 507.133

Int. Cl.³ F27B *14/02*

U.S. Cl. 266—143 7 Claims



1. A reaction installation for the recovery of zinc contained in a stubstance including scrap, residues and mattes of zinc, comprising: a tank for containing the substance in a molten state; a paddle wheel mounted on a vertical shaft in said tank; an upper head member for supporting said shaft, which upper head member is displaceable in a vertical direction and which carries both drive means for driving said shaft and a closure cover for said tank; a horizontally displaceable carriage connected to said head member for supporting said head member; two external upper supports, connected to said tank and which define a rotary axis normal to an axis of said tank for permitting said tank to be moved and for supporting said tank; a sidewall of said tank including a peripheral chamber which surrounds an internal refractory coating of said side wall; means defining an upper annular chamber disposed around said cover for collected gases from said tank; said paddle wheel having blades which are co-planar with the axis of said tank so that they produce in the molten substance a flow in a radial direction, which impinges against the side wall of said tank; and a helicoidal transverse partitioning wall extending through the interior of said peripheral chamber and forming a helicoidal conduit which opens radially to the outside of said tank by way of an upper orifice and a lower orifice, which orifices are provided in an outside wall of said peripheral chamber for the flow of cooling air; said upper annular chamber communicating with the interior of said tank by way of said cover and having an external orifice for the discharge of gases from said annular chamber.

4,456,231

APPARATUS FOR REFINING LEAD

Svend Bergsoe, Glostrup, Denmark, assignor to Paul Bergsoe & Son A/S, Glostrup, Denmark

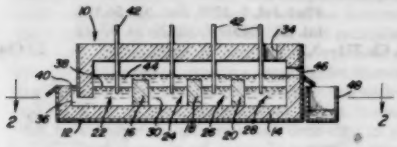
Filed Dec. 21, 1982, Ser. No. 452,020

Int. Cl.³ F27B *3/12*

U.S. Cl. 266—215 5 Claims

1. An apparatus for continuously refining crude molten lead comprising a refractory lined elongate furnace having a crude lead inlet means at one end portion thereof, a refined molten lead outlet means at the other end portion thereof and a slag outlet means in the same end portion as the inlet means, said slag outlet means being at a higher elevation than the molten lead outlet means, said furnace including a plurality of transversely extending divider walls dividing the furnace into a plurality of transverse chambers, each wall having a passage therethrough below the level of the molten lead outlet means

with the passages being staggered to provide a flow path for molten lead, the upper edge of each of the divider walls being between the level of the molten lead outlet means and the slag outlet means to enable slag to overflow the upper edge of the



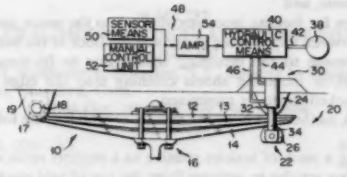
walls during flow from the end portion of the furnace having the molten lead outlet means toward the end portion of the furnace having the slag outlet means therein, and means introducing a reducing agent into the molten lead in the furnace.

4,456,232

APPARATUS FOR CONTROLLING FRICTION BETWEEN LEAF SPRINGS OF A LAMINATED LEAF SPRING ASSEMBLY

Takeyoshi Shinbori, Yokosuka, and Susumu Matsuoka, Atsugi, both of Japan, assignors to NHK Spring Co., Ltd., Yokohama, Japan

Filed Jul. 7, 1982, Ser. No. 395,970
Int. Cl.³ B60G *11/02*
U.S. Cl. 267—54 B **7 Claims**



1. An apparatus for controlling friction between a plurality of stacked leaf springs of a laminated leaf spring assembly, comprising:

clamping means mounted on the laminated leaf spring assembly for supporting a body to be supported and mounted at both ends on the body for clamping the laminated leaf spring assembly in the direction of thickness thereof, said clamping means including a supporting member and a pressure member for clamping the laminated leaf spring assembly therebetween,

hydraulic cylinder means for urging the pressure member of said clamping means to urge the laminated leaf spring assembly to the supporting member of said clamping means, said hydraulic cylinder means including a cylinder, and a piston vertically movably arranged in the cylinder and connected at a free end thereof to the pressure member of said clamping means,

hydraulic control means arranged between a fluid source and said hydraulic cylinder means for controlling the pressure of pressurized fluid supplied from the fluid source to the hydraulic cylinder means, and

detector means for detecting values of predetermined factors of the body to be supported to feed predetermined signals which are a function of the detected values for controlling the pressure of the pressurized fluid at said hydraulic control means in response to the detected values.

4. A method for controlling friction between a plurality of stacked leaf springs of a laminated leaf spring assembly supporting a body, the method comprising:

detecting values of predetermined factors of a body to be supported on which said laminated leaf spring assembly is mounted;

generating signals corresponding to the detected values and supplying said signals to hydraulic cylinder means to control the operating pressure of the hydraulic cylinder means, the hydraulic cylinder means including a piston having a free end;

clamping said laminated leaf spring assembly by a clamping means including a pressure member and a spring supporting member between which said leaf spring is clamped, said pressure member being coupled to said free end of said piston of said hydraulic cylinder means; and

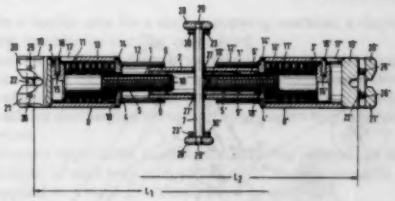
applying a force to said pressure member via said piston of said hydraulic cylinder means to which it is coupled, said pressure member clamping said laminated leaf spring assembly in cooperation with said spring supporting member of said clamping means in the direction of thickness of said laminated leaf spring assembly, said force being a function of the operating pressure of said hydraulic cylinder means which is controlled by said signals.

4,456,233

TENSIONING DEVICE FOR CHAINS

Anton Müller, Aalen-Unterkochen, Fed. Rep. of Germany, assignor to Eisen- und Drahtwerk Erlau Aktiengesellschaft, Aalen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 106,829, Dec. 26, 1979, abandoned. This application Dec. 17, 1981, Ser. No. 331,683
Claims priority, application Fed. Rep. of Germany, Dec. 23, 1978, 2855989
Int. Cl.³ F16F *3/02, 1/32*
U.S. Cl. 267—70 **14 Claims**



1. A tensioning device for suspending, stretching and tightening chains, such as tensioning chains, sling chains, tire chains and the like with the device, the device comprising in combination:

first and second housings, each housing having at one end thereof means for connecting the housing non-rotatably to a chain and each housing having a second end which is open;

a first threaded spindle in the first housing and projecting toward the second end of the first housing, which second end is open, the first threaded spindle having a pitch threaded in one direction;

a second threaded spindle in the second housing projecting toward the second end of the second housing, which second end is open, the second threaded spindle having a pitch threaded in a direction opposite the first threaded spindle;

means cooperating between each spindle and each housing for preventing rotation of the spindle relative to its respective housing while permitting sliding movement of the spindle relative to its respective housing;

a tensioning member extending into the second end of each housing and having oppositely handed threaded portions therein at opposite ends thereof, the threaded portions being threadably engaged with the threaded spindles wherein, when the tensioning member is rotated in one direction, the spindles move toward one another, and when the tensioning member is rotated in the opposite direction, the spindles move away from one another; the

tensioning member holding the first and second housings in spaced relation and defining a space therebetween;

means on the tensioning member located in the space between the housings for establishing a non-rotational relationship with the tensioning member;

a tool cooperating with the means on the tensioning member for rotating the tensioning member;

first abutments secured in each housing between the first and second ends thereof;

second abutments on each spindle in opposed relation to the first abutments;

a set of cup springs in each housing disposed between the first and second abutments, wherein when the tensioning member is turned to draw the spindles together, the cup springs are compressed, whereby a chain attached to the tensioning device can be tensioned by drawing the threaded spindles together without turning the chain.

4,456,234

BANKNOTE DISPENSING MACHINE WITH DELIVERY DEVICE FOR THE RECEIPT FOR THE BANKNOTES DISPENSED

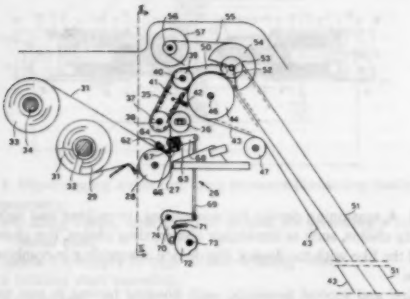
Lucio Simonotti, Banchette d'Ivrea, and Aldo Ricca, Rivarolo, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Turin, Italy

Continuation of Ser. No. 242,135, Mar. 9, 1981, abandoned. This application Jul. 15, 1983, Ser. No. 513,791

Claims priority, application Italy, Mar. 17, 1980, 67399 A/80

Int. Cl.³ B41F *13/64*

U.S. Cl. 270—18 **2 Claims**



1. An automatic banknote dispensing machine having a delivery device for a transaction receipt reporting information with respect to the transaction effected in dispensing the banknotes, comprising: a bundling device having at least one tined wheel adapted to receive sequentially the counted banknotes to be dispensed and to bundle them on a substantially vertical flat support located in correspondence with a predetermined angular position of said wheel, a dispensing mechanism adapted to convey the bundled banknotes to present them to the customer through a slot in the machine, a serial printer for printing a transaction receipt, a device for conveying the transaction receipt for presentation to the customer, said conveying device comprising a pair of continuously movable belts disposed between said printer and said tined wheel so as to bundle and present the transaction receipt to the customer together with the banknotes through said slot, characterized in that said belts define a path for said receipt including a substantially vertical end portion adjacent to said flat support and wherein the receipt is moved downwards, said slot being located directly over said flat support, said dispensing mechanism conveying said banknotes bundled with said transaction receipt toward said slot by moving them, accurately aligned together, upwards along said flat support.

4,456,235

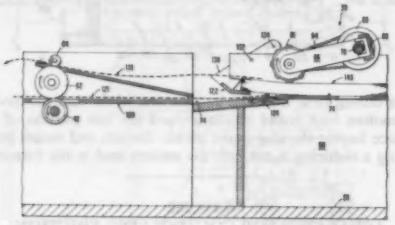
BOTTOM-UP STACKER

Donald F. Colglazier, and Ernest P. Kollar, both of Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 9, 1979, Ser. No. 56,170

Int. Cl.³ B65H *1/30, 29/24, 31/12*

U.S. Cl. 271—3.1 **22 Claims**



1. Apparatus for bottom stacking sheets in a bin comprising in combination:

an air bearing means operable for elevating the sheets in the bin so that said sheets fly relative to the floor of the bin:

means disposed at an entrance of said bin, said means being operable to lift and to support the sheets so that a space is being generated between the floor of the bin and the sheets; and

means for feeding incoming sheets into the space generated between the elevated sheets and the floor of the bin so that damage to the incoming sheets, due to frictional drag and/or incoming sheets crashing into the edge of the stacked sheets, is minimized.

22. A method for handling articles comprising the following steps:

flying a stack of articles relative to a support surface;

feeding articles in seriatim from the top of said stack;

elevating one end of said stack to form a space between said stack and the support surface; and

inserting articles under the stack.

4,456,236

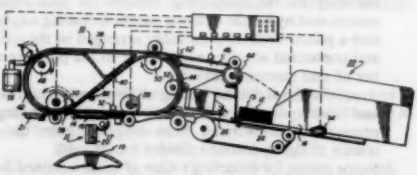
PLURAL MODE RECIRCULATING DOCUMENT HANDLER

Mark H. Buddendeck, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 29, 1981, Ser. No. 316,209

Int. Cl.³ B65H *5/22*

U.S. Cl. 271—3.1 **4 Claims**



1. In a recirculating document handler for plurally recirculating simplex or duplex document sheets to and from a stack thereof to and from the imaging station of a copier for providing both simplex and duplex document sheet precollation copying, the improvement comprising:

plural mode document recirculation means comprising integral plural-mode document recirculation loop path means and selectably movable path selector means in said-plural mode document recirculation loop path means for selecting partially different document recirculation loop paths

therein for providing at least three different selectable recirculative document copying modes,

wherein in one said selected recirculation loop path and copying mode one side of duplex document sheets are copied at said imaging station and then said document sheets are immediately returned directly but inverted to said same copying station in a selective said recirculation loop path for immediately copying the opposite sides thereof and thereafter returning these duplex document sheets to said stack in their original sheet orientation in said stack, to provide an immediate duplex document precollation copying mode in which both sides of all of said duplex documents are copied in each circulation of the duplex document set;

wherein in a second said selected document recirculation loop path and copying mode duplex document sheets are copied on only one side at said imaging station and then directly returned to said stack inverted from their original orientation in said stack, before copying any of the opposite sides thereof, to provide a common side duplex document precollation copying mode in which all of only one side of the duplex documents are copied in each circulation of the duplex document set and the opposite sides thereof are copied in a subsequent set circulation;

and wherein in a third said selected document recirculation loop path and copying mode simplex document sheets are recirculated and copied on only one side thereof and directly returned to said stack without inversion.

4,456,237

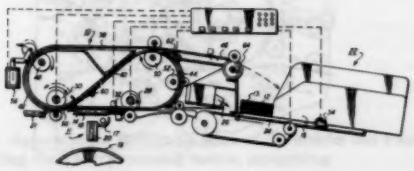
PLURAL MODE RECIRCULATING DOCUMENT HANDLER

Mark H. Buddendeck, Macedon, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1981, Ser. No. 316,694

Int. Cl.³ B65H 5/22

U.S. Cl. 271—3.1 **4 Claims**



1. In a recirculating document handler for plurally recirculating simplex or duplex original document sheets to and from a stack thereof to and from the imaging station of a copier for providing precollation copying, with plural-mode document recirculation loop path means and path selector means therein providing selected different document recirculation loop paths, depending on a selected copying mode, including an oval loop recirculation path over said imaging station having two inverting loop paths, one at each end of said oval loop, and means for selectably feeding document sheets into and out of said oval recirculation path after at least partial circulation therein, the improvement wherein:

said oval document recirculation loop path includes an integral alternative S-shaped document recirculation path for returning duplex documents to said imaging station for immediately copying the opposite sides thereof before return to said stack, wherein said S-shaped document recirculation path comprises both of said inverting loop paths and a bypass path transversely intersecting said oval loop providing an alternate path connecting between opposite ends of said two inverter loop paths and forming the central portion of said S-shaped path, and wherein for said S-shaped document recirculation path the duplex documents are reversed in one of said two inverting loop paths and fed through said bypass path to said other inverter loop path and then to said imaging station,

and wherein alternatively a duplex document sheet may be unidirectionally fed through said one inverting loop path, rather than reversed therein, for direct, inverted, return to said stack.

4,456,238

DUPLEX TRAY FOR DUPLEX COPYING MACHINE AND THE LIKE

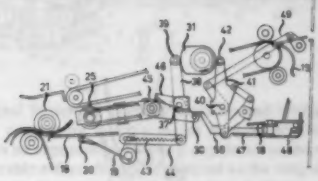
Kenichi Mizuma, Kawasaki, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Mar. 25, 1982, Ser. No. 361,875

Claims priority, application Japan, Mar. 31, 1981, 56-48239; Mar. 31, 1981, 56-46551

Int. Cl.³ B65H 5/22, 1/04, 3/06

U.S. Cl. 271—3.1 **2 Claims**



1. In a duplex tray for a duplex copying machine, a duplex printing machine or the like, comprising:

a gate disposed on the side of an inlet of said tray, which gate can switch the sheet transportation directions from a sheet path for discharging sheets outside said machine to a sheet path for discharging sheets onto said duplex tray, and vice versa;

a pressure application member for applying pressure to the bottom of said tray such that a sheet feeding pressure is applied to a stack of sheets placed on said tray;

means for moving transversely said tray between (i) a reference position at which the position of a reference side wall of said tray coincides with the sheet passing reference line along which sheets pass through said machine and (ii) a position deviated from said reference position; and

an inclined roller movable upwards and downwards and capable of lining up the sheets discharged onto said tray by moving said sheets in a slant direction and along said reference side wall of said tray which is deviated outwards;

whereby, at the time of sheet discharging, said gate is moved to the side of said sheet discharging path of said tray, and said sheet feeding pressure is released, and said tray is moved transversely so as to deviate said reference side wall of said tray slightly outwards beyond said sheet passing reference line, and said inclined roller which is driven in rotation is brought into contact with the top sheet of a stack of sheets which are stacked sheet by sheet in accordance with a one-side reference, so that said sheets are lined up and stacked in conformity with said reference side wall of said tray; and

at the time of re-feeding of said sheets, said gate is switching to the side of said sheet path for discharging sheets outside said machine, and sheet feeding pressure is applied to said tray, and said tray is moved transversely until said reference side wall of said tray coincides with said sheet passing reference line, and said inclined roller is retracted from the top sheet of a stack of sheets placed on said tray, the improvement further comprising:

a single solenoid which is energized or deenergized in accordance with the discharging of sheets onto said tray, and re-feeding of sheets;

a single half-turn cam which is controlled by said solenoid through a spring clutch; and

a linkage mechanism driven by said single half-turn cam for switching the positions of said gate, said sheet feeding pressure application member, said means for moving transversely said tray and said inclined roller in accordance with a mode for sheet discharging and a mode for re-feeding sheets.

4,456,239

SHEET MATERIAL FEEDING APPARATUS

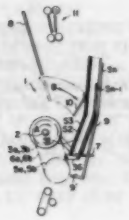
Toshimitsu Yamaguchi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 5, 1982, Ser. No. 405,607

Claims priority, application Japan, Aug. 7, 1981, 56-123754; Oct. 23, 1981, 56-169601

Int. Cl.³ B65H 5/22; B41J 11/58

U.S. Cl. 271—3.1 **3 Claims**



1. A sheet material feeding apparatus for bringing a plurality of sheets from a receiving station to a delivering station, said plurality of sheets being supplied to said receiving station at regular or irregular intervals and being delivered one by one from said delivering station, comprising:

at least one support board for supporting a plurality of sheets in substantially upright condition at said receiving station;

a first inclined board at said receiving station for supporting the plurality of sheets as tilted from the vertical in the order of supply with the supplied sheet at the bottom;

a second inclined board at said delivering station for supporting the plurality of sheets as tilted from the vertical with the order of the sheets being upside down from that on the first inclined board; and

means for moving said support board so as to follow a circulatory path starting from and returning to said receiving station via said delivering station.

4,456,240

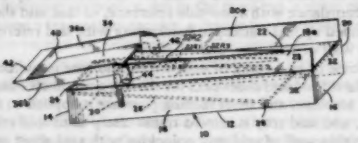
PAPER SUPPLY AND STACKING APPARATUS

Mosi Chu, Setauket; David Chiang, Dix Hills, and Solomon Manber, Sands Point, all of N.Y., assignors to MCC Associates, Short Hills, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,419

Int. Cl.³ B65H 5/22

U.S. Cl. 271—4 **7 Claims**



1. A paper tray comprising a first bottom, first front and rear walls extending upwardly from said first bottom, first and second lower side walls extending upwardly from said bottom, said walls and bottom defining an open boxlike structure for storage of sheets of paper prior to use, a cover pivotably mounted to the top of said lower side walls in the region of said rear wall and extending toward said first front wall, said cover being shorter than said first bottom whereby a gap exists between the free end of said cover and said first front wall so that paper can be removed from the boxlike structure, each of said lower side walls having extensions upwardly extending beyond the level of said cover, and paper receiving means, said receiving means comprising a second bottom upwardly displaced from and overhanging said gap and said first front wall, first and second upper side walls connected to the ends of said extensions remote from said rear wall and extending upwardly from said upper bottom, and a second front wall extending upwardly from the edge of said second bottom remote from the connection to said extensions, said second bottom, said upper side walls and second front wall defining a receptacle for receiving, after use, sheets of paper initially stored in the defined open boxlike structure.

4,456,241

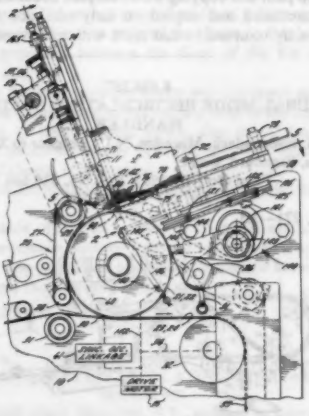
SUCKER TYPE CARD FEEDER

John R. Newsome, R.R. #1, Box 58A, Shumway, Ill. 62461

Filed Aug. 12, 1982, Ser. No. 407,509

Int. Cl.³ B65H 3/08

U.S. Cl. 271—11 **9 Claims**



1. A machine for feeding cards one by one from a vertical stack having a leading edge portion and a trailing edge portion, the cards in the stack having their leading edges in alignment with one another to form a lower corner on the stack, comprising, in combination, a frame, means defining a receiving nip arranged downwardly and outwardly from the lower corner of the stack, a platform on the frame positioned to support the trailing edge portion of the stack and in contact with the bottom card in the stack, a vertical guide arranged at right angles to the platform for engaging the aligned leading edges of the cards in the stack, the edge of the platform being horizontally spaced from the vertical guide to define a downwardly facing access window at the leading edge portion of the stack, a stripper type support for the lower corner of the stack in the form of a projection extending under the corner of the stack a short distance inwardly of the vertical guide, a suction cup facing upwardly into the window, a source of suction coupled to the suction cup, a sucker block for supporting the suction cup, a sucker block carrier, means for supporting the sucker block carrier on the frame for horizontal reciprocating movement in forward and retract directions, a drive for reciprocating the carrier, the sucker block being mounted for horizontal and vertical movement with respect to the carrier between an upraised position in which the suction cup engages the bottom

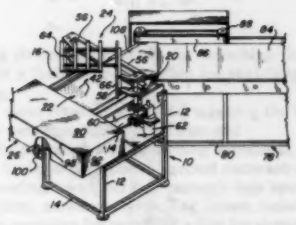
card and a relatively lowered position, a cam surface and cam follower interposed between the sucker block and carrier for imparting vertical movement to the sucker block, a striker on the frame fixedly arranged in the path of horizontal movement of the sucker block as the sucker block is moved by the carrier in the retract direction, the cam surface being so angled that, when the carrier is retracted, the sucker block, during the course of such retracting movement, engages the striker blocking further movement of the sucker block in the retract direction but causing relative motion between the cam surface and cam follower in a direction to cam the sucker block upwardly for engagement of the suction cup with the underside of the bottom card thereby completing an L-shaped path of movement for the suction cup, a biasing spring for biasing the sucker block downwardly with respect to the carrier so that in the subsequent forward stroke of the carrier the suction cup retraces its path moving downwardly until separation occurs at the striker and then forwardly, and means timingly coupled to the drive for applying suction to the suction cup during its downward and forward movement so that the suckingly engaged bottom card flicks downwardly past the projection for stripping from the stack followed by outward feeding of the leading edge of the card into the receiving nip.

4,456,242

APPARATUS FOR SHINGLING STACK OF FLAT ARTICLES

George A. Morin, P.O. Box 826, Aurora, Colo. 80010

Filed May 11, 1981, Ser. No. 262,042
Int. Cl.³ B65H *1/06, 3/12, 5/00, 9/00*
U.S. Cl. 271—94 **3 Claims**



1. Apparatus for shingling a stack of flat articles and transporting them to a processing station, comprising:

a supporting stand;

first conveyor means including a pair of rollers on the stand with motor means to drive one of them, endless belt means mounted on the rollers and driven by the driver roller to cause its upper surface to travel downstream and transport articles in a downstream direction;

a gate on the stand located above and extending across the belt means with the lower edges of the gate located slightly above the surface of the belt means;

the gate comprising two upright walls lying in planes at right angles to each other and at about forty-five degrees to the longitudinal axis of travel of the belt means with their converging angle pointing downstream;

the gate serving to constrain a stack of flat articles in position with the bottom article contacting the belt means and to release them successively in shingled relation and each at an angle of about forty-five degrees to the downstream direction of travel; and

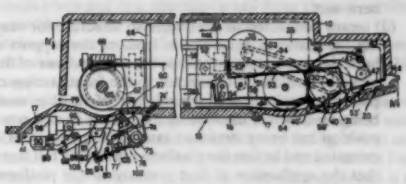
second conveyor means located at the downstream end of the first conveyor means including a stand, a plurality of rollers, and a conveyor belt mounted thereon with its upper reach adapted to be driven in a downstream direction away from the first conveyor means at about forty-five degree angle to transport each article delivered from the first conveyor means with its leading edge extending transversely of the line of travel of the second conveyor means.

4,456,243

ORIGINAL FEEDER FOR COPYING MACHINES

Pantaleo De Simone, Cuorgnè, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Oct. 19, 1981, Ser. No. 312,992
Claims priority, application Italy, Oct. 20, 1980, 68597 A/80
Int. Cl.³ B65H *5/06, 9/06*
U.S. Cl. 271—245 **7 Claims**



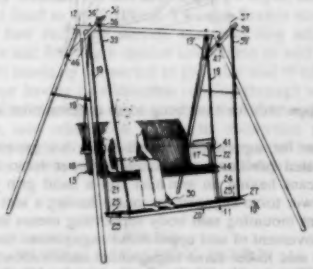
1. Original feeder for copying machine and similar office machines, comprising moving means to feed original documents onto an exposure surface in a registered position, selectively operable reference means adjacent to the output side of said surface to align said documents, and control means responsive to said reference means to control the movement of said document, wherein said reference means includes a stop element mobile from a stopping position to stop said document, to a second position for releasing the document, said stop element being pivoted on an auxiliary frame which swings from a rest position to a working position, said frame being kept in said rest position by a first spring element stretched between said auxiliary frame and selectively movable member, whereby when said stop element is in said stopping position, it is rotated through a predetermined angle by said document arriving on said exposure surface in order to deactivate said moving means for stopping the fed document against the stop element.

4,456,244

SWING PROPELLING FOOT REST

Richard L. Andrews, 4338 Capitol Ave., Macon, Ga. 31206

Continuation-in-part of Ser. No. 195,373, Dec. 31, 1980, abandoned. This application Mar. 10, 1982, Ser. No. 356,938
Int. Cl.³ A63G *9/16*
U.S. Cl. 272—92 **15 Claims**



1. In combination with a swing of the type wherein a seat is suspended by at least one pair of flexible members from an overhead structure, the improvement which comprises:

(a) a pair of support members, each of which is rigidly secured to the seat near the front side thereof and which extends generally downwardly therefrom;

(b) a folding member having a platform and a pair of arms, the opposite end portions of each arm being pivotally connected to the platform proximate the rear edge thereof and to one of the support members;

(c) means connected to the seat for biasing each arm to rotate upwardly about the pivotal joint between the arm and one of the support members, bringing the folding member into a retracted position in which a section of the front edge of the platform is disposed proximate the pivotal joint between one of said arms and one of the support members; the biasing means being overcome by the exertion of pressure on the platform, whereby the platform can be extended generally outwardly of the support members; and

(d) means connected to the overhead structure for suspending the platform generally in front of the support members, the suspending means having a second pair of flexible members which are connected to the front portion of the platform, each of said second pair of flexible members being slack when the folding member is in said retracted position but being stretched taut as the platform is being extended and before the platform reaches its full travel, so that the application of foot pressure to the platform can easily set the swing, initially at rest, in motion.

4,456,245

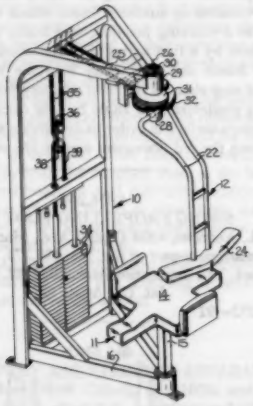
ROTARY TORSO EXERCISE APPARATUS

Dan D. Baldwin, Independence, Va., assignor to Nautilus Sports/Medical Industries, Inc., Lake Helen, Fla.

Filed Dec. 11, 1981, Ser. No. 329,882

Int. Cl.³ A63B *21/06*

U.S. Cl. 272—118 **3 Claims**



1. Apparatus for exercising torso rotation muscles and comprising

means for supporting a user's body in a generally upright seated position and including upper torso engagement means having an arm rest and a hand grip portion and lower torso engagement means having a seat portion,

means mounting said body supporting means for rotational movement of said upper torso engagement means relative to said lower torso engagement means about an axis extending longitudinally of a user's body along a line passing through the user's body adjacent and generally parallel to the spine, and

resistance means operatively connected to said upper torso engagement means for imposing force resisting movement of said upper torso engagement means about said axis, said resistance means including first and second cam members each operative for imposing torque on said upper torso engagement means during rotational movement of said upper torso engagement means in a corresponding one of first and second rotational directions about said axis, and wherein said first and second cam members comprise variation means for changing the amount of force imposed in predetermined relationship to rotation of said upper torso engagement means, said resistance means cooperating with said body supporting means for imposing a preload on a user's body, and further wherein said resistance means further comprises means for selectively operatively coupling said first and second cam members to said upper torso engagement means during rotation thereof in said corresponding directions and for selectively operatively blocking rotation of said first and second cam members during rotation of said upper torso engagement means in directions opposite to said corresponding one direction,

said body supporting means and said mounting means cooperating for restricting movement of a user's body during exercise to rotary movement about said axis and for isolating the torso rotation muscles of the user's body and for exercising such muscles against the force imposed by said resistance means.

4,456,246

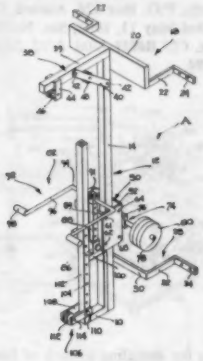
WEIGHT LIFTING EXERCISING APPARATUS

William Szabo, 10126 Langmoir Ave., Sunland, Calif. 91040

Continuation-in-part of Ser. No. 166,077, Jul. 7, 1980, Pat. No. 4,346,888. This application Mar. 26, 1982, Ser. No. 362,168

Int. Cl.³ A63B *21/06*

U.S. Cl. 272—118 **18 Claims**



1. An exercising apparatus comprising:

(a) a main frame having as an upstanding generally vertically disposed structure, a single upstanding pole-like member,

(b) means associated with said pole-like member for mounting said pole-like member and thereby stabilizing same against forces which would cause movement away from a vertical direction,

(c) a carriage of relatively small dimension in the vertical direction compared to its distance of movement and being vertically shiftable on said pole-like member,

(d) a generally horizontally disposed weight retaining barbell member operatively mounted on said carriage for receiving bar-bell weight discs such that a number of different bar-bell weight discs and of differing weights can be removeably disposed on said weight retaining member,

(e) engagable means operatively mounted on said carriage in approximately the same horizontal region as the bar-bell member and on opposite sides of the carriage for permitting the user of the apparatus to use the engagable means to cause application of a force to the carriage against that of the weight discs on the weight retaining means,

(f) a first pair of rollers located between said pole-like member and said carriage and on the same side of said carriage as said engagable means and which supports said carriage in vertical shift movement,

(g) a second pair of rollers located between said pole-like

member and said carriage and which supports said carriage in vertical shiftable movement, said second pair of rollers being located below and on the opposite side of said carriage with respect to said first set of rollers, said first and second pairs of rollers being the primary bearing means between said carriage and said pole-like member, and

(h) a guide track on one flat surface of said pole-like member and that one pair of said first or second pairs of rollers move in said guide track.

4,456,247

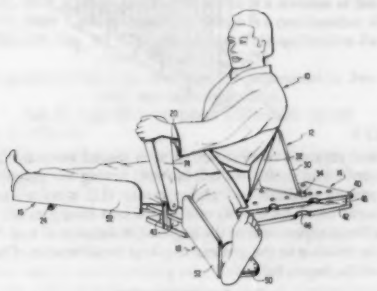
LEG STRETCHING APPARATUS

Ted R. Ehrenfried, 10 Evans Clr., Poquoson, Va. 23662

Filed Mar. 26, 1982, Ser. No. 362,561

Int. Cl.³ A63B *23/04*

U.S. Cl. 272—126 **14 Claims**



1. A leg stretching apparatus for stretching the legs of a person into a "split" condition, said leg stretching apparatus comprising:

a lower torso retaining means for retaining the lower torso of the person using the apparatus; and

means for providing a leg stretching movement, said movement having a component directed rearward of said person tending to spread said person's legs apart, said leg stretching movement providing means including crank means operative for providing a first leg stretching movement and user controlled adjustment means for providing a second leg stretching movement, said adjustment means comprising a means for adjusting the leg stretching movement independent of said crank means operation.

4,456,248

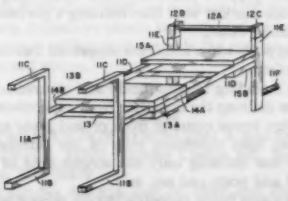
EXERCISER FOR RUNNERS

Robert S. Smith, 1263 Emory St., San Jose, Calif. 95126

Filed Dec. 7, 1981, Ser. No. 327,869

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—134 **11 Claims**



1. Exercise apparatus comprising;

two identical frames, each frame having a substantial "H-shape" with a relatively short member extending from each of the two ends of one of the vertical members of the "H" substantially parallel to the cross-piece forming the center of the "H-shaped" frame attaching one vertical member of the "H-shaped" frame to the other vertical member of the "H-shaped" frame and in a direction away from said other vertical member, the two relatively short members on each "H-shaped" frame forming four support legs for said structure when said structure is mounted in a vertical position;

spacer means holdng one frame spaced relative to the other frame, said spacer means comprising padded members suitable for serving as a seat or a rest for a user;

a hand-grip means extending from the other vertical member of the "H-shaped" frame substantially parallel to the cross-piece and in a direction away from the one vertical member of each "H-shaped" frame;

a sliding support means located to slide along the cross-section member of each "H-shaped" frame so as to adjustably support a user;

whereby said two "H-shaped" frames are assembled relative to each other so that said apparatus can be mounted such that four support legs are vertical in one configuration and horizontal in a second configuration and wherein said four support legs hold said apparatus when said apparatus is in the vertical position and wherein two of said four support legs serve together with one end of the other vertical members of said "H-shaped" frames to support said structure when it is in the horizontal position.

4,456,249

STRETCHING APPARATUS

John Calabrese, 3603 Greengarden Blvd., Erie, Pa. 16508

Filed May 31, 1983, Ser. No. 497,274

Int. Cl.³ A63B *23/00*

U.S. Cl. 272—139 **2 Claims**

1. Self-contained stretching apparatus comprising a first flexible strap loop or collar fitting over the head or neck, a first ring slidably mounted on said first loop, two ropes, each having one end fixed to the first ring, a second flexible strap loop forming a foot receiving stirrup, a second ring adjustably mounted on and forming a tension connection to said second loop, a right handgrip connected to the other end of one rope, said one rope having its midsection running through said second ring, a left handgrip connected to the other end of the other rope, said other rope having its midsection running through said second ring whereby pulling on the handgrips regulates the tension in the ropes between said first and second loops.

4,456,250

BASEBALL TEACHING DEVICE

Mathew R. P. Perrone, Jr., 306 Rustic La., Algonuin, Ill. 60102

Filed Dec. 30, 1981, Ser. No. 335,856

Int. Cl.³ A63B *69/40*

U.S. Cl. 273—26 R **5 Claims**

1. A batting tee for a baseball or a softball suitable for teaching a player a proper level—with a slight uppercut—swing, said tee including a base means and three vertically extending adjustable pole means; wherein:

(a) said three adjustable pole means include a forward pole

and two rear poles in a triangular relationship attached to said base means;

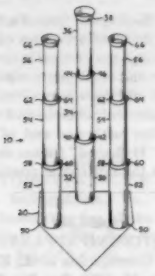
(b) said forward pole serves to hold a softball or baseball;

(c) said two rear poles serve to hold two lightweight balls as swing indicators;

(d) said forward pole and said rear poles have at least two sections and said two sections include a first nestable section and a base section to render said forward pole and said rear poles adjustable in height;

(e) said base section is secured at its lower end to said base and receives the lower end of said first nestable section at its upper end;

(f) a first nestable section clamp is positioned on said first nestable section to adjustably hold said first nestable section relative to said base section;



(g) a ball support means is secured to the upper end of said first nestable section and oppositely disposed from said base section;

(h) said rear poles are substantially equal in height and differ in height from said forward pole;

(i) said ball support means on said rear poles are capable of receiving said two lightweight balls;

(j) said ball support means on said forward pole is capable of receiving said softball or said baseball; and

(k) the predetermined height of said rear poles and said forward pole combine to determine a plane in which a bat must travel to contact all three balls placed on said pole means.

4,456,251

TENNIS BALL REBOUND PRACTICE NET

Anton Balaz, Altmünster, Fed. Rep. of Germany, assignor to Plaspack Kunststoff GmbH & Co. KG, Schwanenstadt, Australia

Filed Aug. 18, 1980, Ser. No. 179,160

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1979, 7923451[U]

Int. Cl.³ A63B *69/40*

U.S. Cl. 273—29 A **2 Claims**

1. A tennis training device comprising:

a four-sided frame (4) adapted to be supported on the ground and having a pair of spaced vertical sides (5, 9) joined to a pair of spaced horizontal sides (17, 21);

a net (8) having an outline similar to that of said frame (4) and being disposed inside said frame (4);

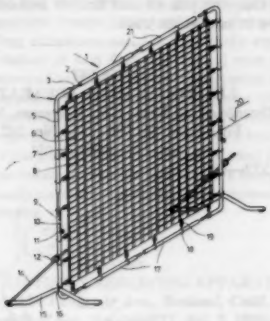
a plurality of resilient means (19) connecting said net (8) to said frame (4);

said net (8) having a first plurality of strings (6) extending in a vertical direction and being elastic, and having a second plurality of strings (7) extending in a horizontal direction and being inelastic;

said net (8) adapted to act as a catch and return surface for a tennis ball impinging against said net (8);

adjustment means (10, 11) on each vertical side (5, 9) of said frame (4) for adjusting the distance between the pair of spaced horizontal sides (17, 21) and thereby adjusting the tension in said first plurality of strings whereby the speed of return of the tennis ball is adjusted;

a ground support for each vertical side (5, 9) including a stand (15) having a ground engaging part and a shaft (16) pivotally carrying its adjacent vertical side (5, 9), an inclined bar (14) pivotally connected at one end to said stand (15), and releasable clamp means (12) mounted on



said adjacent vertical side (5, 9) in spaced vertical relation above said shaft (16), said bar (14) having an opposite end passing through said clamp means (12) whereby movement of said bar (14) relative to said clamp means (12) effects adjustment of the angle of inclination of said frame (4) relative to the ground to select the direction of return of the tennis ball.

4,456,252

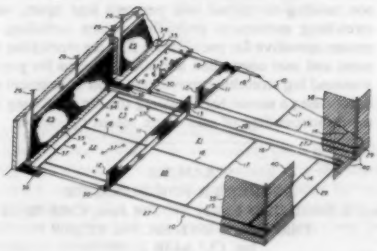
TENNIS SERVICE PRACTICE COURT WITH RECOVERING AND COLLECTING MEANS

Albert C. Hartland, 1738 Nocturne, Houston, Tex. 77043

Filed Sep. 14, 1981, Ser. No. 302,046

Int. Cl.³ A63B *61/00*

U.S. Cl. 273—29 A **9 Claims**



1. A service practice court for tennis comprising

a flat surface marked with lines defining a portion of a regulation tennis court,

supporting posts and a tennis net supported therebetween on said surface,

said lines including longitudinally and transversely extending lines defining the complete front or receiving half of a regulation tennis court in front of said posts and net and including lines consisting only of the sidelines and the service line defining only the service area of the court beyond said posts and net, and

said service area being unobstructed for service practice and the space above said service area being unobstructed to the maximum height of the normal path of service of a tennis ball,

backstop means comprising a net hung vertically across said court just behind said service line beyond said posts and

net to stop the movement of practice tennis balls at that point without obstructing said service area and the space thereabove, and

collecting and recovering means positioned adjacent and immediately behind said net and operable to move spent tennis balls along the entire width of the court to the rear of the court to a point beyond the rear service line for return of the spent balls to the player for further service practice.

4,456,253

HARDBOARD-BONDED MELAMINE OVERLAID SURFACE FOR BOWLING LANE

Peter B. Kelly, Pasadena, Tex., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 81,216, Oct. 2, 1979, Pat. No. 4,336,937, which is a continuation-in-part of Ser. No. 926,604, Jul. 21, 1978, Pat. No. 4,231,573, which is a division of Ser. No. 901,791, May 1, 1978, abandoned, which is a continuation of Ser. No. 506,069, Sep. 16, 1974, abandoned. This application Jan. 15, 1982, Ser. No. 339,474

The portion of the term of this patent subsequent to Jun. 29, 1999, has been disclaimed.

Int. Cl.³ A63D *1/04;* **B32B** *5/26, 5/30, 21/08*

U.S. Cl. 273—51 **8 Claims**

1. A bowling lane having a surface characterized by a falling ball impact resistance of at least 60 inches, a coefficient of friction of at least 0.16 and a Taber abrasion resistance of at least about 400 cycles, said bowling lane comprised of a cellulosic core of at least 60 pounds density and consisting of hardboard, said hardboard having a surface imprinted with a bowling lane design and a coating of a melamine or polyester resin over the printed surface, said core and said coating having a thickness at least sufficient to provide the surface characteristics recited above.

3. A bowling lane having a surface characterized by a falling ball impact resistance of at least 60 inches, a coefficient of friction of at least 0.16 and a Taber abrasion resistance of at least about 400 cycles, said bowling lane comprised of a melamine resin impregnated decorative fibrous print sheet and a cellulosic board at least 60 pounds density consisting of hardboard bonded to said print sheet under heat and pressures from about 1000 psi to about 1500 psi, and having a thickness at least sufficient to provide the surface characteristics recited above.

7. A method of producing a bowling lane having a surface characterized by a falling ball impact resistance of at least 60 inches, a coefficient of friction of about 0.16 and a Taber abrasion resistance of at least 500 cycles comprising:

providing a substrate comprised of a thermosetting melamine or polyester resin impregnated cellulosic board of at least 60 pounds density, said board consisting of hardboard;

superimposing at least one resin impregnated decorative fibrous print sheet over said hardboard in registration therewith; and

consolidating said hardboard and print sheet under heat and pressure from about 1000 psi to about 1500 psi to produce a unitary decorative plastic laminate panel having a thickness at least sufficient to provide the surface characteristics recited above.

4,456,254

APPARATUS FOR STRINGING A RACQUET

Ernest McDonald, 18701 Walkers Choice Rd., Apt. #5, Gaithersburg, Md. 20879

Division of Ser. No. 428,814, Sep. 30, 1982, Pat. No. 4,439,908. This application Nov. 1, 1983, Ser. No. 547,490

Int. Cl.³ A63B *51/14*

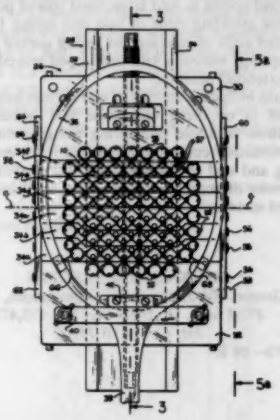
U.S. Cl. 273—73 A **7 Claims**

1. An apparatus for stringing a racquet with a pre-strung web having a linear axis of expansion and a plurality of diamond shaped intersticies having longitudinal axes parallel to said linear axis of expansion, said apparatus comprising:

(a) a base;

(b) a first carriage supported by said base for linear movement;

(c) means for incrementally moving said first carriage linearly along said base;



(d) a plurality of expansion bars supported by said base for collinear movement relative said first carriage, each of said expansion bars being provided with a plurality of upwardly extending pins adapted to engage apexes of said diamond shaped intersticies; and

(e) means coupling selective ones of said expansion bars to said first carriage such that said pre-strung web may be stretched by moving said first carriage along said base.

4,456,255

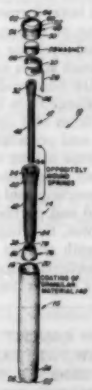
SPRING WHIP DEFENSIVE WEAPON

Harold N. Braunhut, 200 Fifth Ave., New York, N.Y. 10010

Filed Sep. 20, 1982, Ser. No. 419,789

Int. Cl.³ F41B *15/00*

U.S. Cl. 273—84 R **15 Claims**



1. A spring whip comprising:

a hollow housing serving as a hand grip and providing an internal storage compartment for receiving plural lengths of helically wound springs:

said springs being of sequentially increasingly larger diameter sizes;

said springs being operatively arranged relative to each other about a common axis so as to be movable between a telescoped stored position within said storage compartment and an extended whipping position extending from one end of said hollow housing;

an inner end of one spring being adjacent to an inner end of a second spring in said telescoped stored position; and

means for avoiding coils of said one spring from catching between coils of said second spring during movement of said springs between said telescoped stored position and said extended position;

said means including lengths of said springs being alternately wound in opposing clockwise and counter clockwise directions with said one spring being wound in a clockwise direction commencing at said inner end of said one spring and said second spring being wound in a counter clockwise direction commencing at said inner end of said second spring.

4,456,256

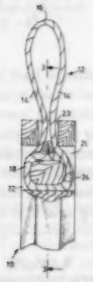
CHUKA STICK SYSTEMS

Douglas Kleeger, 404 Jefferson St., Massapequa, N.Y. 11758

Filed Mar. 15, 1983, Ser. No. 475,473

Int. Cl.³ F41B *15/02*

U.S. Cl. 273—84 R **8 Claims**



1. In a chuka stick system including a longitudinal rod and a loop connected to one or both ends of the rod, the improvement comprising:

first, second and third bores formed in the rod, said first and second bores having an axis substantially perpendicular with the longitudinal direction of the rod, the third bore being a blind bore open at one end of the rod and communicating with said first bore, said first bore being spaced at a predetermined distance from said open end, said second bore being spaced from said open end by a prearranged distance exceeding said predetermined distance;

said loop including a rope having an outside portion, including first and second longitudinal rope portions, and a central portion connecting said first and second portions, and first and second end portions partly disposed in said first and second bores, tied together at their extremities and crossed-over with respect to said first and second longitudinal rope portions, respectively, thereby defining a chuka stick with a loop at one end.

4,456,257

GOLF CLUB SWING TRAINING DEVICE

Sonnie J. Perkins, 1437 180th NE., Bellevue, Wash. 98008

Filed Sep. 16, 1982, Ser. No. 418,815

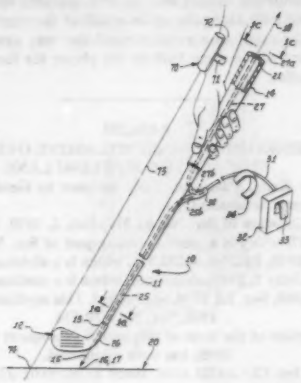
Int. Cl.³ A63B *69/36*

U.S. Cl. 273—186 R **13 Claims**

1. In a golf swing plane sensor, the combination comprising

(a) golf club having a shaft and ball striking head, and

(b) means associated with the club to project a first light beam in a first direction lengthwise of the shaft to intersect the ground as the club is held in ball addressing position and then swung rearwardly, and to project a second light



beam in a second and diametrically opposite direction lengthwise of the shaft to intersect the ground as the club is swung backwardly and upwardly so the free end of the shaft is directed toward the ground.

4,456,258

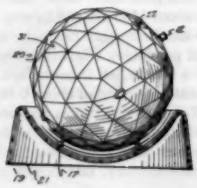
GAME WITH AN ICOSAHEDRAL GEODESIC SPHERE BOARD

Lawrence E. Lodrick, 2436 Harrison Ave. N., Rochester, Mich. 48063

Continuation of Ser. No. 148,293, May 9, 1980, abandoned. This application Feb. 2, 1982, Ser. No. 345,004

Int. Cl.³ A63F *3/00, 3/02*

U.S. Cl. 273—241 **3 Claims**



3. A gaming device comprising:

a geodesic spheroid playing surface;

the playing surface being formed of a plurality of polygons, each contiguous to at least one other of said other polygons;

the polygons being comprised only of those polygons present on the surface of a geodesic solid;

a plurality of playing pieces, the playing pieces being movable across the playing surface in a predetermined manner and sequence defined by the rules of play; means for rotatably supporting the geodesic spheroid;

the supporting means comprising:

a multiplicity of evenly distributed support pins projecting vertically from the playing surface a predetermined distance, the point of attachment of the support pins being at the center of the polygons;

the support pins having at their outer ends a hemispherical shape;

an imaginary continuous surface joining the outermost

points of the support pins defining an imaginary sphere; and wherein

a lower support member having a spherical concave support surface equal in radius to the imaginary sphere; and

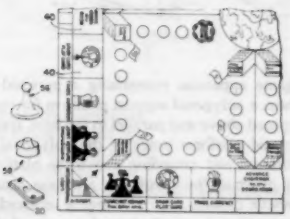
the geodesic solid and support pins rest in the concave support surface.

4,456,259

BOARD GAME

Leonard L. Antal, c/o Total Games, Inc., 1114 S. Austin Blvd., Oak Park, Ill. 60304, and Richard A. Toops, 201 E. Walton, Chicago, Ill. 60611

Filed Sep. 23, 1981, Ser. No. 304,863
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—256 **3 Claims**



1. An apparatus for playing a game comprising:

a board defining a flat playing surface having (a) a peripheral zone being divided into a repetitive set of spaces, each of said spaces having an instructional message; and, (b) a plurality of internal zones defining separate playing areas and placed within said peripheral zone, each internal zone being independent from another internal zone and from said peripheral zone, each internal zone having a plurality of spaces defining a closed path discontinuous from the spaces of said peripheral zone and from other internal zone paths, each internal zone representing a given international currency with at least one of said spaces in each internal zone representing an asset purchaseable in the currency of the internal zone;

a first identifying marker for each player along said peripheral zone spaces;

second identifying markers for the paths of any one of said internal zone spaces;

a given quantity of pieces of simulated paper money corresponding to a given international currency of said internal zone;

a plurality of playing cards bearing written instructions for varying the quantity of simulated paper money of a designated international currency being held by players, the instructional cards being accessible when said first identifying marker lands on selected peripheral zone spaces; and,

means for randomly selecting a number to advance movement of said first identifying marker around said peripheral zone.

4,456,260

PROPERTY GAME HAVING INNER PATH SPACE MARKERS

Allen L. Hilton, 756 N. 300 East, Pleasant Grove, Utah 84062

Filed Jul. 19, 1982, Ser. No. 399,909
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—256 **5 Claims**

1. A board game apparatus for a plurality of participants comprising:

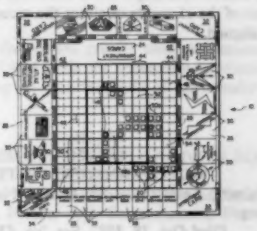
a game board defining a playing surface which comprises:

a peripheral region having a plurality of distinct locations grouped into a first group of locations having first indicia associated therewith, a second group of locations having second indicia associated therewith, and a third group of locations having third indicia associated therewith; said peripheral region defines a first portion of a plurality of continuous paths; and

a central region having an option area and a central area; said central area comprising a plurality of locations defining a plurality of path segments wherein each path segment is disposed intermediate of said option area and one of the locations of said third group of locations and each location of each path segment is subdivided into a plurality of lots; said central region defines a second portion of a plurality of continuous paths;

a plurality of title indicia comprising a plurality of title cards and a plurality of emblems; one title card and one emblem being associated with each location of said first group of locations and having identifying indicia corresponding to the first indicia of such location;

a plurality of instructional cards being associated with the locations of said second group of locations and having instructions thereon;



a plurality of movable game pieces, one for each participant, for movement from location to location, each game piece having directional indicia for distinguishing its direction of movement and differentiating indicia for distinguishing between said game pieces;

a plurality of tokens for associative selective positioning with said emblems on said central area of said game board; a plurality of said tokens being associated with each game piece and having differentiating indicia corresponding to the differentiating indicia of such game piece for distinguishing between said tokens and game pieces;

a supply of simulated currency providing a monetary standard; and

selector means for randomly determining the number of locations to be traversed by a participant's game piece on a participant's turn; said game pieces to be advanced in a continuous path from location-to-location about the peripheral region and through the central region returning to the peripheral region.

4,456,261

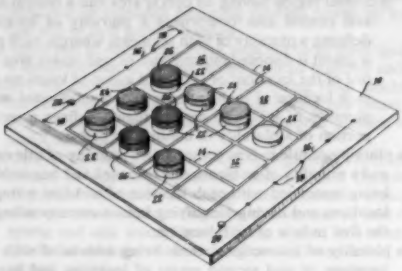
METHOD OF PLAYING A BOARD GAME

Reid J. Daitzman, 1425 Bedford St., Suite 1A, Stamford, Conn. 06905

Filed Oct. 2, 1981, Ser. No. 307,845
Int. Cl.³ A63F *3/00*
U.S. Cl. 273—271 **2 Claims**

1. A method for aligning elements in a linear pattern to determine scoring in an educational and entertaining exercise comprising selecting a plurality of spaces arranged in a regular rectangular array, selecting a plurality of elements for placement in the spaces, the elements being divided into three sets each of which possesses a characteristic distinguishing it from the other set, the number of elements in a first set being equal to the number of spaces, the number of elements in each of the second and third sets being equal to each other and, respectively, to one-half the number of playing spaces, distributing

the elements equally to each of two positions, alternately locating one element in a space from each of the two positions, locating the elements of the first set in the space before locating



any elements of the other two sets therein, locating no more than two elements in a space and determining a score when at least three of the elements of either the second or third set are linearly aligned.

4,456,262

VIDEO SHOOTING SYSTEM

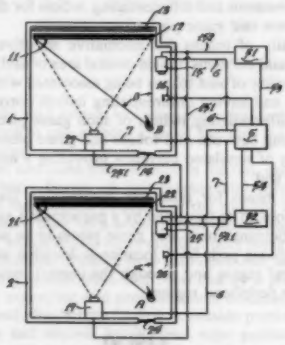
Georg Palmen, Aurinstrasse 52, D 4040 Neuss, Fed. Rep. of Germany

Filed Oct. 18, 1982, Ser. No. 435,076

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1981, 3141798

Int. Cl.³ F41J *9/14*

U.S. Cl. 273—358 **11 Claims**



1. A video shooting system comprising:
a first shooting room;
a first target area in said first shooting room;
a first video camera in said first shooting room;
a first video projector for projecting a scene on said first target area;
a second shooting room;
a second target area in said second shooting room;
a second video camera in said second shooting room; and
a second video projector for projecting a scene on said second target area;
said second video projector being connected and responsive to said first video camera and said first video projector being connected and responsive to said second video camera.

4,456,263

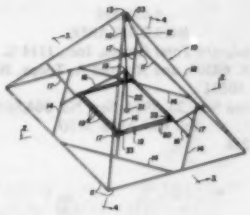
TETHERED MISSILE ELEMENT GAME APPARATUS

Jack T. Hallberg, 3630 Hueco Ave., El Paso, Tex. 79925

Filed Dec. 7, 1982, Ser. No. 447,708

Int. Cl.³ A63B *67/10*

U.S. Cl. 273—393 **11 Claims**



10. A game apparatus comprising a pyramid framework having a base, a polygonal support platform for rows of target elements spaced above and parallel to the base, frame elements supporting said platform inside of the polygonal framework centrally thereof and extending above the platform to form within the pyramid framework an arresting structure for a tethered missile element, and a swinging tethered missile element whose tether is attached to the apex of the pyramid framework and extends substantially below the level of the arresting structure with the missile element disposed at an elevation to strike target elements in the rows along the sides of the platform for dislodging the target elements without striking the platform.

4,456,264

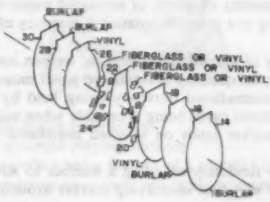
COMPOUND ARCHERY TARGET

Donna Detwiler, 57980 Melissa Dr., Goshen, Ind. 46526

Filed Sep. 27, 1982, Ser. No. 424,907

Int. Cl.³ F41J *3/00*

U.S. Cl. 273—404 **6 Claims**



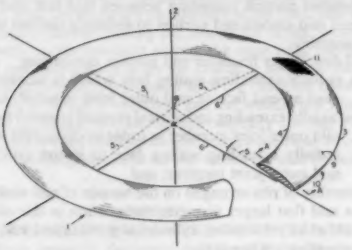
1. A laminated archery target which comprises the following:
a first layer of burlap;
a second layer of burlap;
a third layer of vinyl;
a fourth layer of of loose fiberglass scrap material;
a fifth layer which is a centrally disposed baffle of screening;
a sixth layer of loose fiberglass scrap material;
a seventh layer of vinyl;
an eighth layer of burlap; and
a ninth layer of burlap, said first, second, third, fifth, seventh, eighth, and ninth layers having the marginal edges thereof extending beyond each of said other layers and being stitched together about the margins thereof.

4,456,265

GLIDING RING

Alan J. Adler, 752 La Para Ave., Palo Alto, Calif. 94302

Filed Jan. 16, 1979, Ser. No. 3,992
Int. Cl.³ A63B 65/10
U.S. Cl. 273—425 23 Claims



1. A gliding body comprising;
an annular airfoil defined by;
an upper and a lower surface,
an axis of revolution,
a projected reference plane which is normal to said axis of revolution,
an inner and outer perimeter,
a reference extended chord line,
passing through said inner and outer perimeters,
said annular airfoil configured such that at least a portion of said annular airfoil has a negative airfoil-angle relative to said reference plane, so that, at least in said portion, the outer perimeter of the annulus is lower than the inner perimeter of the annulus when said projected reference plane is horizontal and said body is oriented for proper flight, with said upper surface uppermost; thereby compensating for air downwash and balancing the lift fore and aft in said gliding body,
said annular airfoil having a streamlined cross-section in order to present low aerodynamic drag to a flow of air which is generally parallel to said reference plane,
said annular airfoil having a weight of less than 0.2 ounces per square inch of projected area, thereby permitting a substantially level glide at speeds below 100 feet per second.

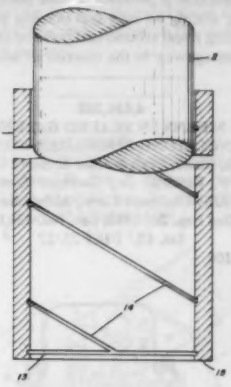
4,456,266

THROTTLE BUSHING

George H. Heinold, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Continuation of Ser. No. 330,588, Dec. 14, 1981, abandoned.
This application Apr. 28, 1983, Ser. No. 489,555
Int. Cl.³ F16J 15/00, 15/16
U.S. Cl. 277—24 2 Claims

1. A throttle bushing for a rotating shaft extending between relatively high and low pressure zones, said throttle bushing comprising a tubular member having an internal surface surrounding said shaft; an annular, debris-collecting groove formed in said internal surface close to the high pressure end of said tubular member; and a debris discharging helical groove formed in said internal surface in communication with said debris-collecting groove and extending to the low pressure end of said tubular member, the direction of generation of said helical groove from the high to the low pressure end of said tubular member being the same as the direction of rotation of said shaft, said helical groove being open at the low pressure end of said tubular member whereby debris collected by said annular groove and moved by said helical groove is discharged from between said shaft and said tubular member at said low pressure end, said debris-collecting groove being disposed a short distance from said high pressure end of said tubular member, the wall of said debris-collecting groove toward said high pressure end forming an annular lip effective as a barrier



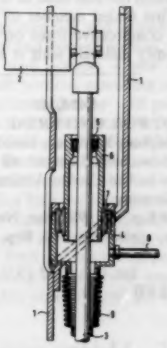
to debris having dimensions greater than the separation between said lip and said shaft, the separation between said lip and said shaft being less than the depth of said annular groove.

4,456,267

SEAL ARRANGEMENT FOR PULL RODS IN ROLLING MILLS

Ottmar Bacharach, Kaiserslautern, Fed. Rep. of Germany, assignor to Gebr. Pfeiffer AG, Kaiserslautern, Fed. Rep. of Germany

Filed Nov. 2, 1982, Ser. No. 438,470
Claims priority, application Fed. Rep. of Germany, Nov. 3, 1981, 3143463
Int. Cl.³ F16J 15/16
U.S. Cl. 277—30 4 Claims



1. A seal arrangement comprising a rolling mill housing, means mounted in said mill housing for forming a housing passageway connecting the interior and exterior of said housing, a pull rod located within said housing and extending through said housing passageway to the exterior of said housing, said pull rod arranged to have a hydropneumatic spring suspension on the free end thereof located outside said housing, wherein the improvement comprises a sleeve laterally enclosing and spaced outwardly from said pull rod, said sleeve extending from the interior of said housing into said housing passageway, a first ball-and-socket joint located within said sleeve and closely laterally enclosing said pull rod forming a narrow bearing gap therebetween, a second ball-and-socket

joint located within said housing passageway and laterally enclosing and supporting the outer surface of said sleeve, a sealing air connection is provided at said housing passageway for introducing sealing air into said housing passageway, and means for forming a seal around said pull rod at the outlet from said housing passageway to the exterior of said housing.

4,456,268

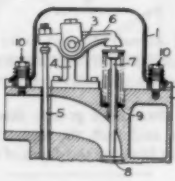
FASTENING MEANS IN SEALED GASKET ASSEMBLY INCLUDING SHOULDER BOLT

Steven M. Penn, Plano, Tex.; Jerome L. Berti, Chicago Heights, and Robert F. Kovarik, Jr., Downers Grove, both of Ill., assignors to Allis-Chalmers Corp., Milwaukee, Wis.

Filed Sep. 30, 1982, Ser. No. 430,007

Int. Cl.³ F16J *15/12*

U.S. Cl. 277—106 **10 Claims**



1. A seal assembly comprising, a first sealed member defining a hole, a second sealed member defining a threaded opening, a seal element positioned between said first sealed member and said second sealed member forming a sealed interface between said seal and each of said members, a bolt defining a bolt head and a threaded portion with the threaded portion received in the threaded opening of said second sealed member, spacer means on said bolt extending from said bolt head to said second sealed member through said hole, resilient means on said bolt, said spacer means on said bolt extending through said hole in said first sealed member and with said resilient means to extend from the bolt head to said first sealed member for biasing said first sealed member to produce and continuously maintain a compressive force on said seal element and thereby continuously maintain seals at said interfaces.

4,456,269

SEALING BOOT FOR UNIVERSAL JOINT ASSEMBLY

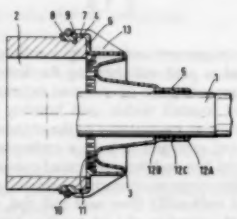
Werner Krude, Siegburg-Kaldauen; Karl-Heinz Müller, Wissen, and Helmut Riemscheid, Lohmar, all of Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed Sep. 29, 1982, Ser. No. 426,642

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1981, 3140514

Int. Cl.³ F16J *15/32*

U.S. Cl. 277—212 FB **1 Claim**



1. A sealing boot made of elastic material for a universal joint assembly which includes an outer joint member and a shaft member adapted to be operatively associated with an inner joint member of said joint assembly, said sealing boot comprising:

a first larger diameter end portion connected in tight sealed engagement with said outer joint member and a second end portion having a relatively smaller diameter than said first end portion connected in tight sealed engagement to said shaft member;

a bellows portion extending between said first end portion and said second end portion to sealingly enclose said joint assembly;

said first larger diameter end portion comprising

a radially extending sealing face which is adapted to engage an end face of said outer joint member, and

an axially extending cylindrical portion adapted to fit over said outer joint member in order to cooperate with said radially extending sealing face to secure said boot to said outer joint member; and

a plurality of ribs arranged on the outside of said sealing boot at said first larger diameter end portion in the vicinity of said axially extending cylindrical portion and said radially extending sealing face;

said ribs being circumferentially spaced about the outer circumference of said sealing boot and to extend radially outwardly substantially parallel to the axis of rotation of said outer joint member;

said ribs acting in the manner of air guide veins and having an elasticity such that they deform together with said bellows portion when said joint is articulated beyond a particular angle of articulation.

4,456,270

CHUCK

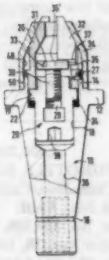
Otto Zettl, Jr., Fellenbergstr. 9, D-8961 Reicholzried, and Otto Zettl, Sr., Stampfweg 12, D-8969 Dietmannsried 1, both of Fed. Rep. of Germany

Filed Dec. 8, 1981, Ser. No. 328,567

Claims priority, application Fed. Rep. of Germany, Dec. 20, 1980, 3048274

Int. Cl.³ B23B *31/19*

U.S. Cl. 279—62 **4 Claims**



1. An improvement for a drill chuck, the drill chuck being of the type having a two-piece housing with a hollow fastening sleeve adapted to be directly attached to a driving member of a drilling machine and a head sleeve removably fastened onto the fastening sleeve, the head sleeve being provided with a frusto-conical inner surface; clamping jaws; a cage arrangement provided within the housing, the cage arrangement having a plurality of axial slits in which the clamping jaws are guided respectively, a two-piece adjusting device including a spindle and a slide stem threadably connected with one another, the spindle being non-shiftably mounted for rotation within the fastening sleeve, the spindle including driving means for rotation responsive to manipulation of an inserted and manually operated key; the slide stem having a front plate, and a plurality of radial grooves arranged in the front plate and opening to the front side thereof, each one of the of jaws being engaged with one of the plurality of radial grooves respec-

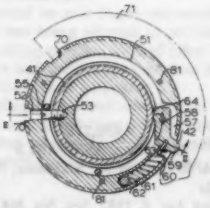
tively for a common axial movement of the plurality of jaws and the slide stem, the spindle being integrally provided with an outer flange received in the housing to prevent axial movement, the improvement wherein the fastening sleeve includes a front side stud and wherein the head sleeve is threaded on the front side stud, the cage arrangement comprising a cage body provided with a conical outer surface at the front end and a cylindrical outer surface at the rearward end; the cage body being fitted with the rearward end thereof in the front side stud of the fastening sleeve; locking pin means for firmly securing the cage body in the fastening sleeve; the cage body having a backward end face spaced from the fastening sleeve to define a peripheral groove in combination with the fastening sleeve in which the outer flange is received; and the spindle including a pocket hole of polygonal cross-section coaxially opening at the backward end face of the spindle and being accessible through the hollow fastening sleeve from the backward end thereof.

4,456,271

TOOL HOLDER WITH CLAMPED POSITION LATCH

Leon O. Kern; James G. Zeilinger, and Gerald E. Mueller, all of Frankenmuth, Mich., assignors to Houdaille Industries, Inc., Ft. Lauderdale, Fla.

Filed Jun. 7, 1982, Ser. No. 385,546
Int. Cl.³ B23B *31/04*
U.S. Cl. 279—91 **2 Claims**



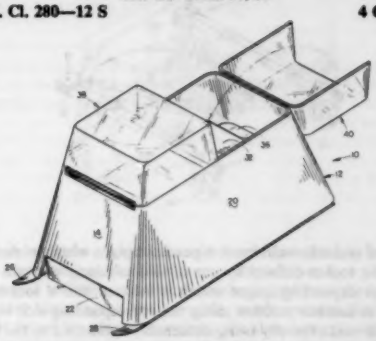
1. A quick change tool holder for tools comprising: a socket member having a tapered inner bore open to an axial end thereof, external threads on the socket member adjacent the axial end, a clamping ring for clamping a tool adapter in said socket, said clamping ring operatively connected to said external threads and rotatable and axially movable with respect to the socket member, a tool adapter having a shaft received in the socket, means on the tool adapter, socket member and clamping ring for establishing tool adapter clamped and unclamped positions with respect to the socket member with the tool holder being freely insertable in and removable from the socket member in the unclamped position and being axially and rotatably secured to the socket member in the clamped position, first lock means operatively associated with the clamping ring for rotation therewith and second lock means associated with the socket member for rotation therewith, said lock means engageable with one another at the clamped position to prevent relative rotation of the clamping ring and socket member and being selectively disengageable to allow such relative rotation, the first lock means including a radially movable pawl means operatively associated with the clamping ring and the second lock means including serrated surface means carried by said socket member, said serrated surface means lying at an outer diameter of portions of the socket member, the pawl, when the clamping ring is in the clamped position lying radially opposed to the serrated surface means and axially aligned therewith, the pawl having a serrated inner diameter surface for engagement with the serrated surface means, the pawl being pivoted about an axial pivot with the pawl inner diameter surface movable radially inwardly and radially outwardly with respect to the serrated surface means, spring means urging the pawl to pivot in a direction to cause the pawl surface to engage the serrated surface means, an engagement surface on said pawl on a side of the axial pivot opposite the pawl inner diameter surface, tool means for engaging the clamping ring to rotate the same with respect to the socket member, means for causing engagement of the tool means with the engagement surface to pivot the pawl about the axial pivot automatically when the tool is applied to the clamping ring to disengage the lock means.

4,456,272

HUNTING BLIND AND ICE FISHING SHED

Donald E. Kroeger, Box 149, Rte. 2, Elkhorn, Nebr. 68022

Filed Sep. 15, 1982, Ser. No. 418,533
Int. Cl.³ B62B *13/00*
U.S. Cl. 280—12 S **4 Claims**



1. A portable hunting blind, comprising,
a bottom portion having front and back walls, and opposite side walls,
said bottom portion having an open upper end,
and a transparent top portion hingedly secured to said bottom portion for selectively closing said open upper end of said bottom portion,
said top portion comprising first and second cover members hingedly secured to said bottom portion,
an upstanding front wall portion, a pair of spaced-apart upstanding side wall portions extending rearwardly from said front wall portion and a top wall portion extending between the upper ends of said front wall portion and said side wall portion, the lower end of said front wall portion being hingedly secured to the upper end of the front wall of said bottom portion, said second cover member comprising an upstanding back wall portion hingedly secured to the upper end of said back wall of said bottom portion, a pair of spaced-apart upstanding side wall portions extending forwardly from said back wall portion, and a top wall portion extending between said upper ends of said back wall portion and said side wall portions.

4,456,273

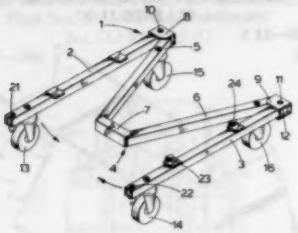
LOAD-CARRYING TROLLEYS

Crerand McKinnon, 1 Stone Rd., Bromley, Kent BR2 9AX, England

Filed Sep. 4, 1981, Ser. No. 299,279
Claims priority, application United Kingdom, Sep. 12, 1980, 8029528; Dec. 9, 1980, 8039458; Apr. 1, 1981, 8110165
Int. Cl.³ B62B *3/02*
U.S. Cl. 280—33.99 H **2 Claims**

1. A load-carrying trolley comprising a load-supporting deck and opposed load-retaining side walls, the said deck being

raisable from its horizontal working position and said side walls being relatively pivotable from a mutually parallel relationship into a mutually convergent relationship which permits the trolley to be nested with other like, similarly converted trolleys, with the improvement that the trolley comprises a wheeled base unit which is independent of said side walls; said base unit comprises opposed side beams and an intervening bridge portion to which such side beams are pivotally connected by tubular pivot pins to allow said side beams to be pivoted in the horizontal plane into convergent relationship with each other; each side beam carries a supporting trolley wheel at a position towards the free end of such beam; and



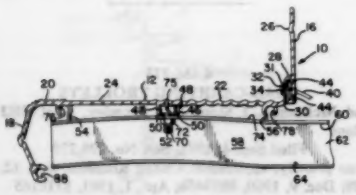
each of said side walls has a dependent spigot which is inserted into the socket defined by one of said tubular pivot pins and another depending spigot which is inserted into a socket located at another position along the corresponding side beam, the side walls thereby being detachably connected to the base unit so that they are supported by said side beams and move as a unit therewith in any said pivotal movement thereof.

4,456,274
Patent Not Issued For This Number

4,456,275
RUNNING BOARD CONSTRUCTION

Steven A. Snyder, Constantine, Mich., and Gary L. Reeve, LaGrange, Ind., assignors to Coachmen Industries, Inc., Middlebury, Ind.

Filed Feb. 12, 1982, Ser. No. 348,507
Int. Cl.³ B60R 3/00
U.S. Cl. 280—163 **18 Claims**

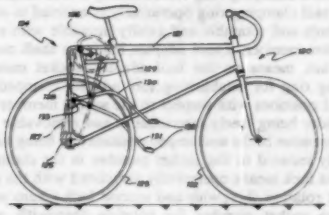


1. A running board for mounting on a vehicle comprising:
an elongate deck;
mounting means for substantially horizontally mounting said deck to the vehicle, said mounting means including at least one elongate bracket means for extending beneath and substantially transverse to the deck, said bracket means also being attachable to the frame of the vehicle; and
fastener means for fastening said elongate bracket means to the underside of said deck such that when said fastener means is fastened to the deck said elongate bracket means is bowed upwardly toward the underside of said deck by said fastener means over at least a portion of its length beneath the deck, said fastener means including spacer means in contact with said bracket means for spacing at least a part of said bracket means from the underside of said deck, and means spaced from said spacer means for drawing said bracket means upwardly to effect bowing of said bracket means.

4,456,276
BICYCLE ASSEMBLY

Peter Bortolin, 4/40 Cannon St., Stanmore, New South Wales, 2041, Australia

Filed Apr. 8, 1982, Ser. No. 366,506
Claims priority, application Australia, Apr. 15, 1981, PE8459; May 27, 1981, PE9046; Jan. 29, 1982, PE2491
Int. Cl.³ B62M 1/04
U.S. Cl. 280—257 **3 Claims**



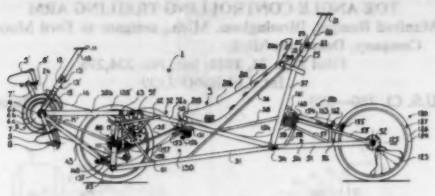
1. A velocipede including a frame; at least one rear driven wheel rotatably mounted on the frame; and a pedal drive assembly oppositely mounted on the frame and operatively associated with said wheel to drive the wheel; said assembly including a pair of pedal levers pivotally mounted on the frame so as to be pivotable about a first axis, a pedal mounted on the other end of each lever, a drive sprocket mounted on said frame for rotation about a fixed second axis, a driven sprocket attached to said wheel so as to drive same, said driven sprocket being rotatable about the rotational axis of said wheel, a link being pivotally attached to each lever intermediate its extremities and pivotally attached to said drive sprocket so as to rotate same upon reciprocation of said pedals, and wherein said first axis is spaced from the wheel axis and is fixed relative to the frame at a location above said wheel.

4,456,277

TRICYCLE

Alan E. Carpenter, Lyons, Colo., assignor to Cyclodynamics of Colorado, Inc., Boulder, Colo.

Filed Jul. 12, 1982, Ser. No. 397,024
Int. Cl.³ B62K *23/06*; B62M *1/06*
U.S. Cl. 280—282 71 Claims



1. A human rider powered tricycle of a 2-1 configuration comprising in operative combination:

(a) a triangulated space frame;

(b) a front-end assembly which includes a pair of steerable front wheels;

(c) means for driving said front wheels mounted on said frame which includes gears and a crank assembly engageable by said human rider;

(d) a seat mounted on said frame rearwardly of said front wheels, said seat being adapted to provide a semirecumbent, supine riding position for said rider, said seat having a seat portion and a rigid back portion adapted to resist thrust from the hips of said rider;

(e) a single trailing rear wheel mounted on said frame;

(f) means for steering said front wheels; and

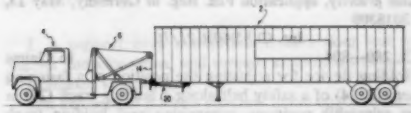
(g) said steering means including handlebars pivotally mounted beneath said seat to said frame.

4,456,278

TRAILER TOWING DEVICE

T. Walton Chapman, Chapman Equipment Sales, R.D. 1, Box 105, DuBois, Pa. 15801

Filed Apr. 7, 1982, Ser. No. 366,282
Int. Cl.³ B60P *3/06*
U.S. Cl. 280—402 7 Claims



1. Apparatus for towing a trailer which has a pin for coupling the trailer to a towing vehicle, said apparatus comprising:

a U-shaped plate adapted to be mounted to the pin;

a pair of flexible members;

means associated with said plate for attaching said pair of flexible members to said plate;

an elongated member adapted to engage an edge portion of the trailer;

means associated with said elongated member for spacing said flexible members from each other;

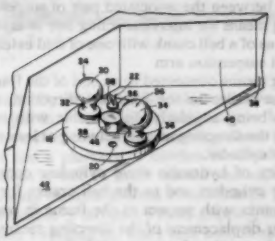
said flexible members each comprising a first portion extending from said attaching means of said plate to said spacing means of said elongated member, and a second portion extending beyond said elongated member and adapted to be attached to a towing vehicle.

4,456,279

MULTIPLE CONNECTION TRAILER HITCH

Benny L. Direk, P.O. Box 91, Inola, Okla. 74036

Continuation of Ser. No. 218,651, Dec. 22, 1980, abandoned, which is a continuation of Ser. No. 968,075, Dec. 11, 1978, abandoned. This application Dec. 10, 1981, Ser. No. 329,190
Int. Cl.³ B60D *1/06*
U.S. Cl. 280—415 A 7 Claims



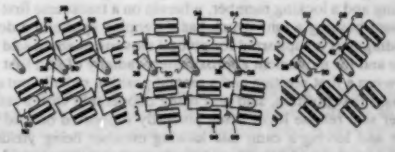
1. A multiple connection trailer hitch for a vehicle bumper and comprising a main unitary support plate means, a plurality of spaced ball-type connector members rigidly secured to the support plate means and movable simultaneously therewith, pivot means for pivotally securing the plate means to the bumper, locking pin means cooperating between the support plate means and bumper for securing the plate means in a preselected orientation with respect to the bumper whereby a selected one of the ball-type connector members may be utilized for the connection operation, the pivot means comprising a substantially centrally disposed bore provided in the support plate means for alignment with a complementary bore provided in the bumper, bushing means disposed in said first mentioned bore, and locking bolt means extending through the bushing means and second mentioned bore for receiving lock nut and lock washer means on the outer end thereof for alternately locking the support plate means in a preselected orientation with respect to the bumper and releasing the support plate means for manual angular adjustment to a new orientation with respect to the bumper, and the locking pin means comprises a plurality of spaced bores provided directly in the support plate means, an individual bore provided in the bumper means for selective alignment with any one of the plurality of spaced bore, and a locking pin removably insertable through any aligned bores for cooperating with the pivot means to secure the support plate means to the bumper.

4,456,280

HYDRAULIC TRAILER STEERING SYSTEM

David E. Gevers, Lafayette, Ind., assignor to Talbert Manufacting, Inc., Pleasant Ridge, Ind.

Filed Jan. 7, 1982, Ser. No. 337,865
Int. Cl.³ B62D *13/04*
U.S. Cl. 280—444 4 Claims



1. A trailer, comprising:

a frame,

a plurality of bell cranks, each being symmetrical about its transverse axis, and being pivotally supported on the frame,

a plurality of suspension units pivotally connected to the frame about substantially vertical axes to permit directional displacement of each suspension unit with respect to the frame, each suspension unit having a single axle, and each unit including a suspension arm having a forwardly extending tongue and a rearwardly extending tongue and wherein the plurality of suspension units are arranged as a plurality of laterally associated pairs of suspension units, two abreast, a laterally associated pair of suspension units being connected to a common bell crank positioned on the frame between the associated pair of suspension units,

coupling means for interconnecting one of said symmetrical portions of a bell crank with one of said extending tongues of said suspension arm

directing means connected to an end of the frame for directing the trailer in the intended direction, the directing means being angularly displaceable with respect to the frame, the directing means including at least one hydraulic master cylinder,

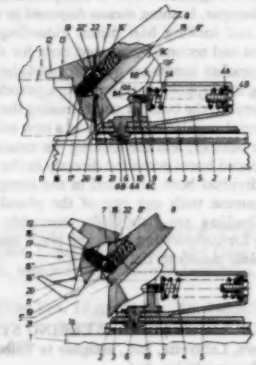
a plurality of hydraulic slave cylinders connected to the master cylinders and to the bell cranks for pivoting the bell cranks with respect to the frame in response to any angular displacement of the directing means with respect to the frame, thereby causing the suspension units to pivot such that their axles are directed toward a common center.

4,456,281

HEEL HOLDER

Theodor Nitschke, Vienna, and Engelbert Spitaler, Wr. Neudorf, both of Austria, assignors to TMC Corporation, Baar, Switzerland

Filed Aug. 19, 1982, Ser. No. 409,472
Claims priority, application Austria, Aug. 20, 1981, 3650/81
Int. Cl.³ A63C *9/08*
U.S. Cl. 280—628 **19 Claims**



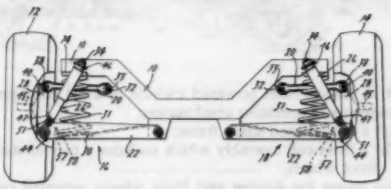
1. A heel holder, comprising a base plate and means for supporting said base plate on a ski, on which base plate a housing is supported, said housing having therein a release spring and a locking member, wherein on a transverse first axle of said housing a unit which has a stepping spur and a downholding part is supported for pivotal movement about said first axle and for movement approximately radially of said first axle between a first position and a second position radially outward of said first position, said unit being cooperable with a release lever said release lever being pivotally supported on said first axle and having a cam; said locking member being yieldably urged against said cam by said release spring, wherein said unit is pivotable relative to said release lever when said unit is in said second position, is fixed against pivotal movement relative to said release lever when in said first position, is biased by a first spring which urges it to pivot upwardly relative to said release lever, and is biased by a second spring which urges it away from said first axle and said release lever.

4,456,282

INDEPENDENT REAR WHEEL SUSPENSION WITH A TOE ANGLE CONTROLLING TRAILING ARM

Manfred Rumpel, Birmingham, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 24, 1981, Ser. No. 334,295
Int. Cl.³ B60G *3/00*
U.S. Cl. 280—690 **10 Claims**



1. An independent rear wheel suspension for a vehicle comprising:

a chassis;

a wheel support member;

shock absorbing means having one portion thereof operably connected to said wheel support member and another portion connected to said chassis;

at least one transversely extending control arm pivotably connected at its inboard end to said chassis and at its outboard end to said wheel support member;

a spring seat seating a spring means operably interposed between said wheel support member and said chassis;

a longitudinally extending arm having a front end connected to said chassis and its other end rigidly connected to said wheel support member;

means for directing said longitudinally extending arm inboard during wheel recession to enhance toe-in of said wheel during wheel recession.

4,456,283

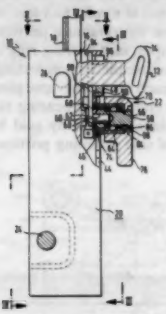
POSITIONALLY ADJUSTABLE HOLDING DEVICE FOR AN ENGAGING MEMBER OF A SAFETY BELT

Forkel Michael, Coburg, and Hans-Joachim Volk, Ebersdorf, both of Fed. Rep. of Germany, assignors to Metallwerk Max Brose GmbH & Co., Coburg, Fed. Rep. of Germany

Filed May 4, 1981, Ser. No. 260,425
Claims priority, application Fed. Rep. of Germany, May 13, 1980, 3018309
Int. Cl.³ B60R *21/10*
U.S. Cl. 280—804 **16 Claims**

1. Holding device for adjusting the position of a fastening member (12, 14) of a safety belt along a holding track (20) in various selectable positions, comprising said holding track forms an elongated slot (42), said slot (42) having a plurality of pairs of recesses (44) spaced apart along the elongated direction of said slot (42) with the recesses in each said pair of recesses being located opposite one another, a sliding member (22) arranged to receive said fastening member (12, 14) for the safety belt supported in said holding track (20) and being displaceable along said holding track, said sliding member (22) having a bearing bolt (60) thereon extending through and axially transversely of the elongated direction of said slot (42) and being movable freely along the elongated direction of said slot, said sliding member (22) including a locking pin (58) axially alignable with said bearing bolt (60), said locking pin having a central borehole (62) in one end thereof arranged for displaceably receiving said bearing bolt (60), said locking pin

(58) being selectively engageable into said pairs of recesses (44) but not being engageable within said slot (42) between said recesses, spring means (70) biasing said locking pin (58) toward said holding track (20) and said bearing bolt (60), and an actuating handle (76) attached to said locking pin for displacing said locking pin (58) against the force of said spring means (70) so that said locking pin can be released from engagement with said pairs of recesses (44).



4,456,284

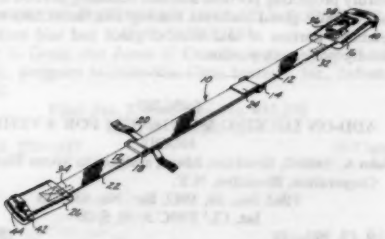
CONVERTIBLE SKIER SEAT AND SKI CARRIER

James Y. Saka, 2470 Adriatic Ave., Long Beach, Calif. 90810

Filed Jan. 27, 1983, Ser. No. 461,595

Int. Cl.³ A63C *11/02*

U.S. Cl. 280—812 **9 Claims**



1. A support strap convertible from a skier seat to a ski carrier and vice versa, said support strap comprising:

elongated strap means;

first and second pockets attached to the opposite extremities of said strap means for receiving a pair of ski pole handles, respectively, whereby said strap means is adapted to be suspended between generally upright ski poles to define a skier seat; and

first and second ski straps attached to said first and second pockets, respectively, and adapted to define loops into which the hands of a skier in said ski seat can be inserted for stability, said support strap being capable of use as a ski carrier by separating said pockets from said ski pole handles, and disposing said first ski strap about a pair of skis in engagement with at least a portion of the ski bindings thereof, and disposing said second ski strap about both skis above said first ski strap to define a loop to fit over the shoulder of the skier.

4,456,285

LONGITUDINALLY ADJUSTABLE SKI POLE

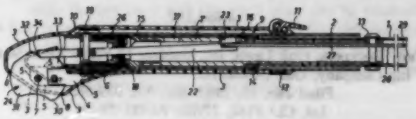
Hans Weber-Henning, Dorfhalde 14, 8712 Stäfa, Switzerland

Filed Feb. 8, 1982, Ser. No. 346,745

Claims priority, application Switzerland, Feb. 19, 1981, 1121/81

Int. Cl.³ A63C *11/22*

U.S. Cl. 280—823 **16 Claims**



1. A longitudinally adjustable ski pole comprising two tube sections arranged in a telescopic relationship, a handle grip disposed on the outer tube section, latching means including a latch member and a plurality of catches for fixedly latching said tube sections in one or more related and extended positions, an operating member located at said handle grip within a reach of the fingers of the skier's hand gripping said ski pole, a spring member engaging the inner tube section and the outer tube sections for biasing said tube sections away from each other to an extended position, a double arm, spring-biased tilting lever supported in said outer tube section, said latching member arranged at one arm of said tilting lever and the other arm of said tilting lever being engaged by said operating member, said operating member and said tilting lever being shiftable into three different positions to selectively engage and disengage said latching means to enable said tube sections to move to and from said retracted and extended positions with the spring biasing said tilting lever being in a tensioned condition at all of said positions.

4,456,286

APPARATUS FOR WALL MOUNTED PRESENTATION BOARDS

Walker Jamar, 365 S. First Ave., East, Duluth, Minn. 55802

Division of Ser. No. 222,383, Jan. 6, 1981, Pat. No. 4,403,761, which is a continuation-in-part of Ser. No. 86,431, Oct. 19, 1979, Pat. No. 4,311,295. This application Apr. 23, 1982, Ser. No. 371,416

Int. Cl.³ B42D *17/00*; A47B *97/04, 23/04*

U.S. Cl. 281—15 B **1 Claim**

1. A presentation arrangement, comprising a presentation board, means for mounting the presentation board on an upright surface with at least its upper edge being in close proximity to said surface, a presentation pad comprising a sheaf of sheets bound together at one end and free at an opposing end such that individual sheets may by exposed by displacing the

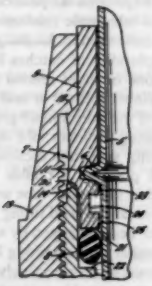
free ends of covering sheets, means for securing the bound end of the pad to the presentation board such that the pad is oriented with the bound end constituting the bottom and the unbound end constituting the top of the pad, and means for retaining the unbound end of the pad against the board such that unintended displacement of the sheets is prevented but successive sheets may be exposed by releasing covering sheets from said retaining means and allowing the released sheets to hang down from the bound end.

4,456,287

ROTARY COUPLING

Rudy Bisonaya, Oak Lawn, Ill., assignor to Elkay Manufacturing Company, Oak Brook, Ill.

Filed Jan. 15, 1982, Ser. No. 339,685
Int. Cl.³ F16L *27/00, 17/00, 19/06*
U.S. Cl. 285—281 **13 Claims**



1. A rotary coupling comprising:
a first tubular member having exterior screw threads adjacent one end;
a second tubular member rotatably and telescopically received in said end of said first tubular member and having an exterior circumferential bead;
a bearing member encircling said second tubular member and providing an internal circumferential groove receiving said bead to hold said bearing member against relative axial movement;
said bearing member having a flexible lip defining the lower side of said groove;
a retaining nut on said second tubular member and received on said screw threads of said first tubular member and engaging said bearing member to hold said first and second tubular members in telescoping relation;
said bearing member and said first tubular member having faces cooperating when said retaining nut is tightened on said first tubular member, for axially compressing said bearing member to grip the bead, said lip being flexible to limit the gripping force on said bead for maintaining the relative rotatability of said tubular members.

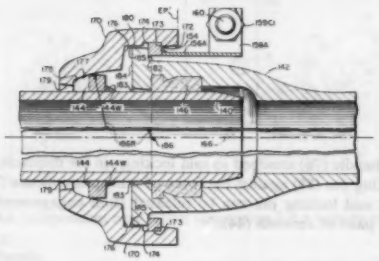
4,456,288

SNAP RING AND RESTRAINED PIPE JOINT USING SAID SNAP-RING

Randall C. Conner, Birmingham, Ala., assignor to American Cast Iron Pipe Company, Birmingham, Ala.

Continuation-in-part of Ser. No. 242,925, Mar. 12, 1981. This application Jun. 22, 1982, Ser. No. 390,881
Int. Cl.³ F16L *21/08*
U.S. Cl. 285—321 **23 Claims**

1. A pipe joint restrained against axial separation comprising:
a first pipe having a cylindrical socket;
a second pipe having a cylindrical spigot extending into said cylindrical socket and including an outwardly projecting portion;
a gasket sealing the joint between the cylindrical spigot and the cylindrical socket;
a bearing ring retaining portion;
a ring assembly having a first part positioned within said retaining portion and a second part positioned outside of said retaining portion, said first part including a bearing ring having two ends at a split, and said bearing ring being positioned between the retaining portion and one of said first and second pipes, said bearing ring uniquely defining a plane, two transverse pieces connecting said first part to said second part, each said transverse piece being attached to one of the two ends of said bearing ring and extending away from the plane defined by said bearing ring to a position outside of said retaining portion;



said second part including a ring adjustor, said ring adjustor located outside of the plane defined by the bearing ring and adapted to adjustably constrain the bearing ring by allowing adjustment of the diameter of the bearing ring; and
further including an annular gland, and wherein said socket includes an outwardly projecting portion, said annular gland encircling said socket outwardly projecting portion and said spigot outwardly projecting portion, said annular gland including a spigot bearing portion bearing against said spigot outwardly projecting portion, and said retaining portion is part of said annular gland and said bearing ring bears between said retaining portion of said annular gland and said socket outwardly projecting portion.

4,456,289

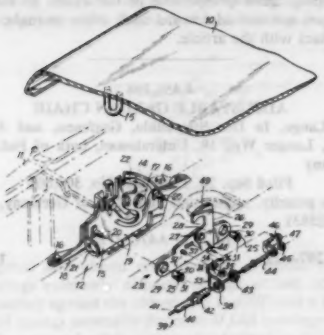
ADD-ON LOCKING MECHANISM FOR A VEHICLE HOOD

John A. Badiali, Brockton, Mass., assignor to Metra Electronics Corporation, Brooklyn, N.Y.

Filed Sep. 30, 1982, Ser. No. 430,725
Int. Cl.³ E05C *3/30, 9/00*
U.S. Cl. 292—28 **15 Claims**

1. A combination, comprising:
(a) a factory-installed primary motor vehicle hood locking arrangement including
(i) wall means on a vehicle hood and forming an opening thereon,
(ii) a support member stationarily mounted on a vehicle body in the vicinity of said hood opening, and
(iii) a cable-released locking catch having a substantially hook-shaped catch portion mounted on the support member for pivoting movement between a hood-closed position in which the hook-shaped catch portion is received in said hood opening and engages the wall means forming the same, and a hood-released position in which the hook-shaped portion is removed from said hood opening; and
(b) an add-on auxiliary locking mechanism accessory including
(i) a locking latch having a substantially hook-shaped latch portion,
(ii) means for mounting said locking latch adjacent the

locking catch on the support member for movement between a locking position in which said hook-shaped latch portion is simultaneously received in said same hood opening in which the hook-shaped catch portion is received in said hood-closed position and in which said hook-shaped latch portion engages the wall means forming said same hood opening to thereby prevent opening of the hood regardless of the position of the locking catch, and an unlocking position in which said



hook-shaped latch portion is removed from said hood opening to thereby permit opening of the hood in said hood-released position of the hook-shaped catch portion, and

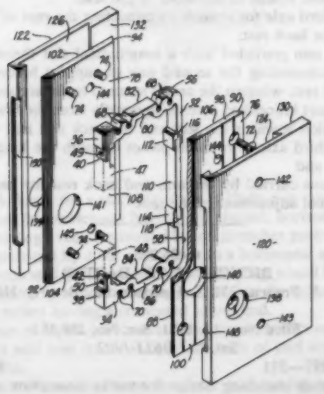
(iii) means for moving said locking latch independently of the movement of the locking catch, said moving means including a connecting cable connected to said locking latch for moving the latter between its locking and unlocking positions.

4,456,290

MOUNTING HARDWARE ASSEMBLY FOR GLASS DOOR CUTOUTS

Robert A. Gross, and James F. Guardia, both of Yorba Linda, Calif., assignors to Brite-Vue Glass Systems, Inc., Industry, Calif.

Filed Jan. 3, 1983, Ser. No. 433,270
Int. Cl.³ E05B 9/00
U.S. Cl. 292—337 **15 Claims**



1. An assembly to retain hardware including a latch plate to a glass door defining at least one generally rectangular cutout for that purpose between first and second facing edges connected by a third edge therebetween, said assembly including:

spacer member means configurated for positioning in the defined cutout adjacent the first cutout edge, the second cutout edge and at least a portion of the third cutout edge, said spacer means having:

respective edge surfaces for facing the first, second and third cutout edges, respectively,

first and second side surfaces; and

at least one latch plate surface facing opposite said second edge thereof on which the latch plate can be retained;

a first fastener plate positioned to abut said first side surfaces of said spacer member means and extend over portions of the door adjacent the first and second cutout edges thereof, said first fastener plate having:

first and second edges; and

means for fastening to said spacer member means;

a second fastener plate positioned to abut said second side surfaces of said spacer member means and extend over portions of the door adjacent the first and second cutout edges thereof, said second fastener plate having:

first and second edges; and

means for fastening to said spacer member means;

a first cover plate positioned facing said first side surfaces of said spacer member means and extending over portions of the door adjacent the first, second and third cutout edges thereof, said first cover plate having:

a channel with sides shaped to engage said first and second edges of said first fastener plate; and

a second cover plate positioned facing said second side surfaces of said spacer member means and extending over portions of the door adjacent the first, second and third cutout edges thereof, said second cover plate having:

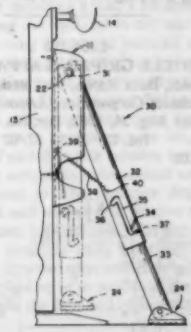
a channel with sides shaped to engage said second and second edges of said first fastener plate.

4,456,291

DOOR PROP

Earl W. Brogle, Box 336, Warrenville, Ill. 60555

Filed Aug. 28, 1981, Ser. No. 297,088
Int. Cl.³ E05C 17/16
U.S. Cl. 292—338 **2 Claims**



1. A door prop to prevent door opening, comprising in combination, a base mounted under a door knob on a door, and a brace assembly supported from said base, said base comprising a channel with opposing end walls spaced within which said brace is secured, a lower end of said brace having a foot for frictional engagement upon a floor, and means for pivoting an upper end of said brace assembly on said channel and lowering said foot to engage the floor frictionally wherein said means comprises a cross pin through an upper end of said brace assembly being pivotable in a hole in each said end wall, whereby said brace assembly normally hangs vertically in said

channel spaced from floor surface, said brace assembly including a foot guide pin bolt slidably mounted in a tube groove having upper and lower transverse terminals for retaining said foot in the position spaced from said floor surface and in an operative extended position abutting said floor surface.

4,456,292

ELECTROMAGNETIC GRIPPING ARRANGEMENT FOR METALLIC WORKPIECES

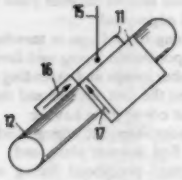
Jochen Haeusler, Nuremberg; Horst Friemert, Erlangen, and Remi Kutchukian, Nuremberg, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 5, 1981, Ser. No. 290,312

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1980, 3031146

Int. Cl.³ B66C *1/04*

U.S. Cl. 294—65.5 **2 Claims**



1. An arrangement for gripping metallic workpieces formed of electrically highly conductive materials, the arrangement being provided with at least one gripping element for producing electromagnetic forces and at least one gripper arm, the arrangement further comprising a linear motor stator circuit for producing travelling magnetic fields in the gripping element and inducing eddy currents in the metallic workpieces, said eddy currents producing magnetic components interacting attractively with said travelling magnetic fields travelling in the direction that the workpieces are to be gripped and thereby exerting gripping forces on the workpieces.

4,456,293

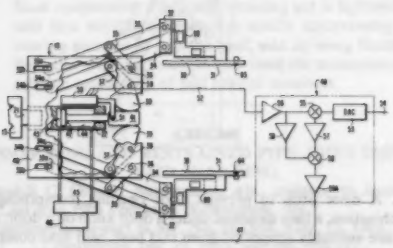
ARTICLE GRIPPING APPARATUS

Hugo A. Panissidi, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 24, 1982, Ser. No. 411,113

Int. Cl.³ B25J *15/02*

U.S. Cl. 294—106 **13 Claims**



13. Gripper control apparatus comprising a pair of fingers having gripping surfaces for gripping an article, characterized by:

four-bar linkage means, including a pair of arcuately movable parallel beams operatively connected to each of the fingers, and a link connected to each beam intermediate its ends, said beams and links being pivotally connected to a fixed member; and

means for operatively applying a force to at least one of the links of each pair for causing the arc described by each beam to be substantially cancelled by the arc generated by each link, thereby so controlling movement of the beams and fingers as to cause said gripping surfaces to concurrently move in rectilinearly aligned paths and remain parallel throughout their excursion during gripping and releasing of the article, and apply to the article a constant gripping force irrespective of the extent to which said fingers are moved toward each other to make gripping contact with the article.

4,456,294

ADJUSTABLE GARDEN CHAIR

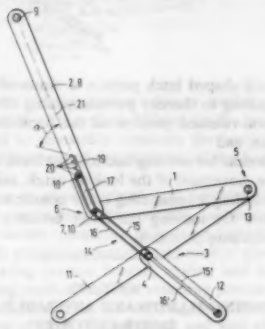
Jürgen Lange, In Der Stegmühle, Grafenau, and Alexander Härty, Langer Weg 19, Untersiemau, both of Fed. Rep. of Germany

Filed Sep. 22, 1981, Ser. No. 304,604

Claims priority, application Fed. Rep. of Germany, Sep. 26, 1980, 8025831

Int. Cl.³ A47C *3/20*

U.S. Cl. 297—21 **10 Claims**



1. An adjustable garden chair including a seat, back rest, and a cross frame defined by first and second pairs of support braces, which chair comprises:

(a) a first axle for rotatably connecting the first and second pairs of support braces;

(b) a second axle for rotatably connecting the first pair of support braces to the front of the seat;

(c) a third axle for rotatably connecting the rear of the seat to the back rest;

(d) an arm provided with a longitudinal slot therethrough for connecting the second pair of support braces to the back rest, wherein the arm is secured to the second pair of support braces and extends upwardly from the first axle of rotation towards the seat and the back rest and wherein the third axle of rotation passes through the longitudinal slot; and

(e) means carried by the arm and back rest for permitting vertical adjustment of the seat.

4,456,295

BICYCLE SEAT ADAPTER

Nicholas J. Francu, 331 S. Harrison St., Beverly Hills, Fla. 32665

Filed Nov. 12, 1981, Ser. No. 259,453

Int. Cl.³ B62J *1/02*

U.S. Cl. 297—211 **9 Claims**

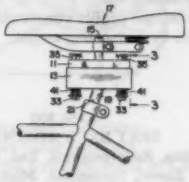
1. A shock absorbing device for use in association with the seat of a bicycle or the like comprising:

(a) a first housing adapted for receiving a saddle-like seat, said first housing being rectangularly cubical in configura-

tion and presenting four sidewalls defining an open end and a closed end,

(b) a second housing adapted for attachment to the frame of a bicycle, said second housing being rectangularly cubical in configuration and presenting four sidewalls defining an open end and a closed end,

(c) resilient securing means effective for cushionably securing said first and said second housings in predetermined variable colinear and interacting relationship as the wheels of said bicycle are subjected to shock of varying intensity, said securing means comprising a first set of coil springs internally disposed of said housings and abutting



against said closed ends thereof, a second set of coil springs exteriorly disposed of said second housing and abutting against the closed end thereof, and a third set of coil springs internally disposed of said housings and coaxially arranged relative to predetermined ones of said first set of coil springs, and

(d) means associated with said sidewalls of said first and said second housings effective for preventing lateral and longitudinal motion of the seat relative to the bicycle as might otherwise be permitted by the resilient nature of said resilient securing means and caused by the normal forces experienced by a rider during his use of the bicycle.

4,456,296

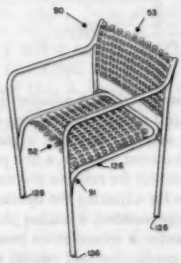
STACKABLE ARMCHAIR

David L. Rowland, 8 E. 62nd St., New York, N.Y. 10021

Filed Jun. 11, 1981, Ser. No. 272,692

Int. Cl.³ A47C *15/00*

U.S. Cl. 297—239 **27 Claims**



1. A frame for a stacking chair, including in combination:

a seat frame element having a U-shaped, horizontal portion having a rear, horizontal lateral stretcher portion joined at each end by a curved corner to a horizontal side portion, each said horizontal side portion being joined by a curved corner to a downwardly and outwardly extending frame portion having a truncated lower end,

a pair of frame-juncture-and-spacing members each secured to said seat frame at opposite ends of said stretcher portion,

a pair of rear leg frame members each having an upwardly extending back-support portion, each said rear leg frame member being secured to a said frame-juncture-and-spacing member and held thereby at a distance apart greater than the distance between the outermost portions of said side members,

said back-support portion terminating at the upper end in an oblique edge surface, said back support portions being generally parallel to each other but diverging somewhat upwardly, and

a pair of front leg and arm frame members each providing a vertical front leg and a coplanar horizontal arm spaced outwardly and above and parallel to said horizontal side portion of said seat frame member and having an upwardly and inwardly extending portion with an inboard rear surface secured to the oblique edge surface of said back-support portion,

each said front portion of said seat frame element being secured to a said front leg.

4,456,297

DENTAL CHAIR

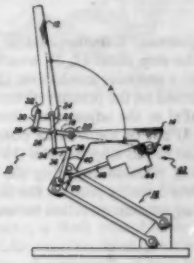
Helmut Pietschmann, Karlsbad, and Herbert Lipp, Pfinztal, both of Fed. Rep. of Germany, assignors to Sybron Corporation, Rochester, N.Y.

Filed May 18, 1981, Ser. No. 264,486

Claims priority, application Fed. Rep. of Germany, May 16, 1980, 3018686

Int. Cl.³ A47C *1/032*

U.S. Cl. 297—316 **3 Claims**



1. A dental chair including a seat, a backrest and mechanism pivotally connecting the backrest to the seat comprising:

(a) a first link having a first end jouraled to said seat;

(b) a second link having a first end journaled to said backrest, said links crossing and being pivotally connected intermediate their ends to form a scissor linkage;

(c) a rocker arm connecting the second end of said first link to said backrest to permit arcuate displacement of the second end of said first link relative to said backrest;

(d) a crank arm connecting the second end of said second link to said seat to effect arcuate displacement of the second end of said second link relative to said seat;

(e) said mechanism being operative when said crank arm is moved in the direction away from said backrest to pivot said backrest downwardly, and concurrently said scissor linkage being operative to move the first end of said second link toward the first end of said first link.

4,456,298

APPARATUS FOR STEPWISE ADJUSTMENT OF SEPARATION BETWEEN TWO CHAIR PORTIONS

Emil Gottstein, Albbruck, Fed. Rep. of Germany, assignor to Martin Stoll GmbH, Fed. Rep. of Germany

Filed Oct. 15, 1981, Ser. No. 311,884

Claims priority, application Fed. Rep. of Germany, Oct. 15, 1980, 3038880

Int. Cl.³ A47C *1/00*

U.S. Cl. 297—353 **19 Claims**

1. Mechanism for stepwise adjustment of the distance between a primary element, attached to one part of a chair, and

a secondary element attached to another part, characterized by: (a) two stop slides (2, 3) mounted on the primary element (1) to slide in the direction perpendicular to the adjustment direction, between an opening position and a locking position, (b) a number of stop recesses (16) in each stop slide (2, 3), one above another in the adjustment direction, placed on a first side of each stop slide which faces the other stop slide, and open to said first side, with the stop recesses (16) of the two stop slides (2, 3) lying opposite one another in pairs, (c) an elastic element (36) for pushing the stop slides (2, 3) into the locking position, (d) a bolt (46) passing between the stop slides (2, 3), perpendicular to the adjustment direction and to the direction of displacement of the stop slides (2, 3), attached to the secondary element, and (e) a spreader mechanism (21, 22; 37, 38), with a mover (4), mounted on the primary element (1) such that it can be shifted parallel to the adjustment direction to displace the stop slides (2, 3) out of the locking position into an opening position with the paired stop recesses (16) of the stop slides (2, 3) in the locking position engaging the bolt (46) from both sides, while in the opening position the bolt (46) can be moved parallel to the adjustment direction between the stop slides (2, 3).

4,456,299

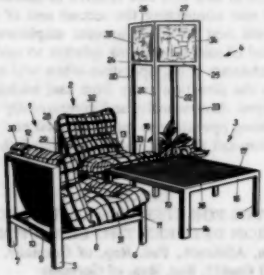
PROFILE SYSTEM FOR ASSEMBLING A PLURALITY OF DIFFERENT PIECES OF FURNITURE

Georg Steinmetz, Fischbach, Fed. Rep. of Germany, assignor to Tefo AG, Zug, Switzerland

Continuation of Ser. No. 59,495, Jul. 23, 1979. This application Nov. 16, 1982, Ser. No. 442,186

Int. Cl.³ A47C 7/00

U.S. Cl. 297—440 **31 Claims**



1. Apparatus for connecting together different pieces of furniture, said apparatus comprising:

at least one elongated first profile having at least two main webs extending at predetermined angles relative to each other, each having longitudinally spaced-apart first edge portions and distal second edge portions; a connecting web connecting said first edge portions, one side of said connecting web defining in combination with said main webs a hollow portion with an open side at said second edge portions; means for connecting a capping to said main webs to cover said open side; and guideway means being provided at said opposite side of said connecting web, said guideway means adapted to receive attachment members;

at least one attachment member for supporting other elements of said article of furniture, said attachment member being adapted to be inserted into and received in said guideway means; and

at least one second profile connectable to said at least one first profile by connecting means.

4,456,300

SEAT BACK ADJUSTER

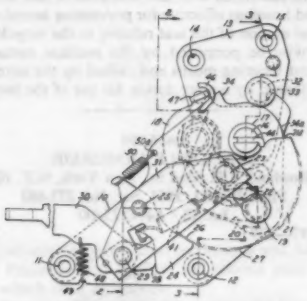
Bernd A. Kluting, Radevormwald, Fed. Rep. of Germany, and Vikram H. Zaveri, Springfield, Mich., assignors to Keiper Recaro, Inc., Battle Creek, Mich.

Continuation of Ser. No. 72,013, Sep. 4, 1979, Pat. No. 4,355,846. This application Sep. 16, 1982, Ser. No. 418,784

The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.

Int. Cl.³ A47C 1/026

U.S. Cl. 297—366 **12 Claims**



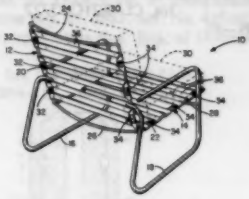
1. A fine increment seat back adjuster for vehicle seats having a tiltable backrest member comprising a first hinge member connectable to a seat rest member, a second hinge member connectable to a backrest member, a first pivot means connecting said hinge members for relative pivoting movement, drive engageable means for adjusting the operative pivotal position of said second hinge member, a ratchet plate having a circular arcuate toothed sector, a second pivot means spaced from said first pivot means connecting said ratchet plate and first hinge member, a differential translation drive connection between said drive engageable means and ratchet plate spaced relatively more from said first and relatively less from said second pivot means so as to provide an amplified angular displacement of said ratchet plate about said second pivot means for any corresponding angular displacement of said operative pivotal position of said second hinge member about said first pivot means, manually releasable toothed pawl means mounted on said first hinge member for engagement and retention of said toothed sector in any adjusted angular position of said ratchet plate relative to said first hinge member, stop means for limiting the extremities of movement of said ratchet plate relative to said pawl, and means for positively preventing overtravel of said ratchet plate to a position limited by said stop means where pawl engagement cannot produce full tooth engagement.

4,456,301

FURNITURE CONSTRUCTION

Arthur A. Apissomian, Wadena, Minn., assignor to Homecrest Industries Incorporated, Wadena, Minn.

Filed Aug. 17, 1981, Ser. No. 293,372
Int. Cl.³ A47C 7/00
U.S. Cl. 297—445 2 Claims



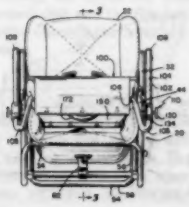
1. A furniture construction comprising:
a pair of spaced-apart frame members;
means for holding the frame members in a relatively fixed spaced relationship;
a plurality of closed loop sections of flexible plastic webbing, each having a pair of loop end portions and a middle portion therebetween; and
a plurality of opposing pairs of outwardly extending ear members, each having spaced-apart side edge portions with the ear members extending outwardly from and regidly attached to each frame member and each ear member being positioned on the frame members in an approximate angular range of 135° to 340° with a plane formed by the frame members, the side edge portions of each ear member being inclined inwardly toward their extremities and having such extremities spaced apart a distance substantially equal to the overall width of the loop section so as to position the flexible webbing in a flat relationship with respect to the plane formed by the frame members and with the middle portions of each loop section parallel to each other when the loop end portions of the flexible webbing are stretched over the side edge portion of the ear members placing the middle portions in tension.

4,456,302

JUVENILE SEAT WITH ADJUSTABLE AUTOMATIC LOCKING BARRIER

Roy E. Knoedler, and Otis J. Basey, both of Columbus, Ind., assignors to Cosco, Inc., Columbus, Ind.

Filed Oct. 28, 1980, Ser. No. 201,549
Int. Cl.³ A47C 31/00
U.S. Cl. 297—488 19 Claims



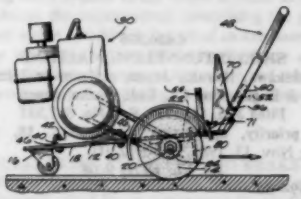
1. A juvenile car seat adapted to be held in place within a vehicle to restrain a juvenile occupant, comprising a seat for placement of a juvenile occupant, a barrier positionable in front of the seat for limiting forward movement of the occupant, coupling means for pivotally coupling the barrier to the seat to permit movement of the barrier relative to the seat, the coupling means including an arm for carrying the barrier and a pivotal connection for pivotally connecting the arm to the seat, and self-locking latch means to latch said arm to said seat, said self-locking latch means including a first portion on the arm and a second portion on the seat, the second portion of the latch means being provided on a circumference of a circle having a radius generally equal to the distance between the pivotal connection and the first portion, the first portion engaging the second portion when the barrier is moved toward the seat, said self-locking latch means, when engaged, prohibiting movement of the barrier in a direction away from the seat, thereby limiting forward movement of the occupant, and means for releasing the latch means so that the barrier can be moved relative to the seat.

4,456,303

MACHINE AND METHOD FOR GROOVING PAVEMENT

Joseph E. Due, 777 Crescent, P.O. Box 134, Mauston, Wis.

Filed Apr. 5, 1982, Ser. No. 365,777
Int. Cl.³ E01C 23/09
U.S. Cl. 299—10 9 Claims



1. A machine for use in grinding a groove in pavement and for forming a beveled edge on the sidewalls of the groove, the machine including a frame having opposite ends, roller means for supporting said frame for movement along the pavement surface, said roller means including casters supporting one of said ends of said frame, a shaft rotatably supported by said frame and supported for rotation about a horizontal axis transverse to the direction of movement of said frame, said shaft having opposite ends, one of said ends of said shaft extending laterally of said frame, handle means for guiding said frame as said frame moves across the pavement surface, an engine supported on said end of said frame supported by said casters and drivingly connected to said shaft for rotatably driving said shaft, a pair of grooving blades mounted on said one end of said shaft such that said grooving blades are positioned in stacked face-to-face relation and laterally of said frame, said grooving blades being positioned on said shaft with the faces of said grooving blades defining vertical planes parallel to the direction of movement of said frame, and means for removably securing said pair of grooving blades on said shaft.

4,456,304

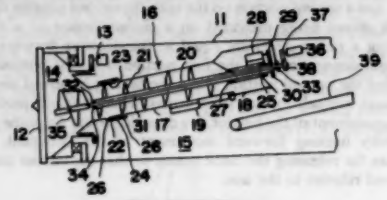
SHIELD TUNNELING MACHINE AND EARTH REMOVING APPARATUS THEREFOR

Tadao Yoshikawa, Ibaraki, and Shoji Nishida, Higashi-osaka, both of Japan, assignors to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed May 27, 1982, Ser. No. 382,708
Claims priority, application Japan, Jun. 15, 1981, 56-88157[U]
Int. Cl.³ E21D 9/08
U.S. Cl. 299—33 8 Claims

1. An earth removing apparatus for a shield tunneling machine comprising a tubular casing having an excavated earth inlet at one end thereof and a closable outlet for excavated earth at the other end; a hollow outer rotary shaft rotatably disposed within the casing and provided with earth conveying blade means on its outer periphery, the rotary shaft being rotatably supported on the casing by an annular member provided around the blade means and rotatably received through

a bearing in an annular recess formed in the casing adjacent said one end thereof; and an inner rotary shaft rotatably extending through one end of the outer rotary shaft and having



a projection extending through one end of the outer rotary shaft and through the earth inlet of the casing, the shaft projection being provided with earth kneading blade means.

4,456,305

SHIELD TUNNELING MACHINE

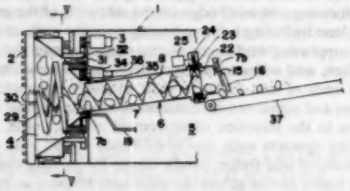
Tadao Yoshikawa, Ibaraki, Japan, assignor to Hitachi Shipbuilding & Engineering Co., Ltd., Osaka, Japan

Filed Jun. 14, 1982, Ser. No. 387,937

Claims priority, application Japan, Sep. 18, 1981, 56-139455[U]; Nov. 13, 1981, 56-169523[U]

Int. Cl.³ E21D 9/08

U.S. Cl. 299—33 8 Claims



1. A shield tunneling machine comprising:

a hollow sheild main body;

a cutter head rotatably disposed at one end of the main body and adapted to be driven by first drive means;

a pressure chamber formed within the main body immediately behind the cutter head;

an atmospheric pressure compartment formed within the main body in the rear of the pressure chamber;

shaftless earth kneading screw means comprising a helically twisted strip rotatably provided within the pressure chamber, the earth kneading screw means being adapted to be driven by second drive means for kneading the excavated earth introduced into the pressure chamber through the cutter head; and

an earth removing apparatus provided within the main body and holding the pressure chamber in communication with the atmospheric pressure compartment; the earth removing apparatus comprising a fixed tubular casing having at a front end portion thereof an earth inlet opened to the pressure chamber and at a rear end portion thereof a closable earth outlet communicating with the atmospheric pressure compartment, and a shaftless screw conveyor comprising a helically twisted strip rotatably provided within the casing, the screw conveyor being adapted to be driven by third drive means for conveying the excavated earth introduced into the casing through the earth inlet.

4,456,306

COOLING SYSTEM FOR COOLING THE BITS OF A CUTTING MACHINE

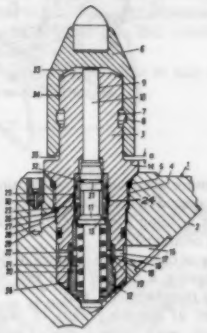
Herwig Wrulich; Alfred Zitz; Otto Schetina, and Siegmar Gekle, all of Zeltweg, Austria, assignors to Voest-Alpine Aktiengesellschaft, Vienna, Austria

Filed Mar. 2, 1982, Ser. No. 353,936

Claims priority, application Austria, Mar. 12, 1981, 1135/81

Int. Cl.³ E21C 35/22

U.S. Cl. 299—81 11 Claims



1. A cutting assembly having at least one nozzle for directing a coolant to the work area, the coolant supply being dependent on the application of pressure to the assembly, the assembly comprising a cap-shaped cutting bit, a bit holder having a shaft to receive said bit, the bit being capable of limited axial movement on said shaft, a shutoff valve for the coolant within said shaft, a coupling member connecting the valve with the bit such that the valve opens on axial movement of the bit when cutting pressure is applied.

4,456,307

CUTTER BIT ASSEMBLY

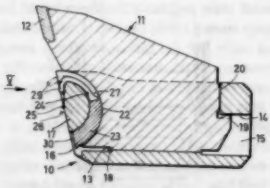
Gerhard Merten, Lunen; Oswald Breuer, Dortmund; Norbert Hesse, and Bernd Steinkuhl, both of Lunen, all of Fed. Rep. of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jun. 25, 1982, Ser. No. 392,353

Claims priority, application Fed. Rep. of Germany, Mar. 16, 1982, 3209410

Int. Cl.³ E21B 10/00

U.S. Cl. 299—93 21 Claims



1. A cutter bit assembly comprising a holder and a cutter bit, the holder being formed with a pocket into which the cutter bit is mounted, wherein the cutter bit is retained within the pocket against a surface of the holder by means of an arcuate tapered wedge forcibly received in a gap formed between confronting curved support faces formed respectively on the cutter bit and the holder.

4,456,308

WHEEL AND BRAKE-DRUM CONFIGURATION FOR VEHICLES

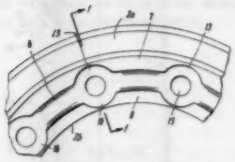
Paul Opel, Langenfeld; Klaus Herbst, Solingen; Heinz Brinkmann, Hagen; Albrecht Lüders, Haan, and Hans P. Wolsdorf, Eichwald-Krummhardt, all of Fed. Rep. of Germany, assignors to Mannesmann AG, Solingen, Fed. Rep. of Germany

Continuation of Ser. No. 173,829, Jul. 31, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 427,865

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1979, 2931400

Int. Cl.³ B60B *3/14, 11/00*

U.S. Cl. 301—9 DN **6 Claims**



1. In a combined wheel and brake drum for a vehicle, wherein the wheel includes a wheel disk having an annular flange provided with a plurality of annularly arranged bores, a hub and the drum each having a flange provided with a matching plurality of annularly arranged bores, one of said latter flanges having annularly extending plane interface surface means, the respective other flange being also provided with interface means for interfacing with the surface means of the one flange, the improvement comprising:

the interface means including a first annular surface portion more radially outward from the bores and extending between the bores, and a second annular surface portion more radially inward from the bores, there being accordingly annular indent means in said interface means, and providing for a relatively locally reduced wall thickness, the annular indent means extending radially between said first and second surface portions for separating the first and second surface portions completely and thus extending from bore to bore of the plurality of bores, the indent means having portions surrounding respectively each one of the bores, radial width dimensions of the indent means being larger for the bore-surrounding portions than in portions extending from bore to bore, at least one of the first and second surface portions being composed of azimuthally separated, annularly arranged, surface portion segments; and

bolt means traversing the bores for bolting together the flange of the wheel disk and the flanges of the hub and of the drum, thereby causing the interface means to engage the surface means.

4,456,309

WHEEL SLIDE PROTECTION SYSTEM

Heinrich B. Rath, Vallendar, Fed. Rep. of Germany, assignor to Lucas Industries Limited, Birmingham, England

PCT No. PCT/GB80/00144, 371 Date May 12, 1981, 102(e) Date May 12, 1981, PCT Pub. No. WO81/00834, PCT Pub. Date Apr. 2, 1981

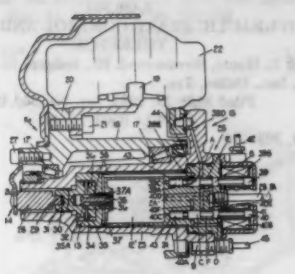
PCT Filed Sep. 18, 1980, Ser. No. 262,910

Claims priority, application United Kingdom, Sep. 18, 1979, 7932247

Int. Cl.³ B60T *8/02, 13/00*

U.S. Cl. 303—10 **30 Claims**

1. In a hydraulic wheel slide protection system for a vehicle including a modulator valve arranged to control the supply of working fluid to a wheel brake, a pump adapted to be driven from the wheel and operable to supply fluid to the modulator valve, and sensing means arranged to sense an incipient wheel slide condition of the wheel during running of the vehicle, and to produce a signal when such a condition is sensed, the modulator valve being operative in response to said signal to modify



the braking force applied to the wheel in order to correct the slide condition, the improvement comprising the pump is incorporated within a hollow axle part of an axle assembly upon which the wheel is supported for rotation there around, the pump being located adjacent to the wheel and adapted to be driven therefrom as a function of the speed of that wheel only.

4,456,310

HYDRAULIC PUMP AND ANTI-SKID BRAKE SYSTEM

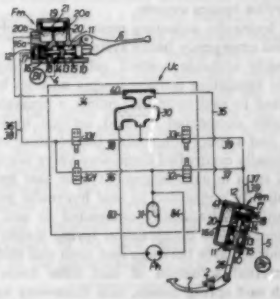
Tsutomu Hayashi, Hoya; Masaie Kato, Musashino, and Mitsuru Saito, Koganei, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 13, 1981, Ser. No. 263,347

Claims priority, application Japan, May 15, 1980, 55-64539; May 15, 1980, 55-64538; Sep. 25, 1980, 55-133314

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—10 **21 Claims**



1. A hydraulic pump comprising a pump body including first and second partitions dividing said pump body into a spring chamber, a pump chamber and an operation chamber, said first partition being between said spring chamber and said pump chamber, said second partition being between said pump chamber and operation chamber, said spring chamber having a fluid inlet, suction valve means connecting said pump chamber and spring chamber for providing communication therebetween when said pump chamber is at a reduced pressure, delivery valve means connected to said pump chamber for delivering fluid therefrom when fluid in said pump chamber is at elevated pressure, a drive member in said operation chamber, a tappet slidably engaged in said second partition and driven by said drive member, a plunger slidably engaged in said first partition and disengagably contacted by said tappet, said plunger and

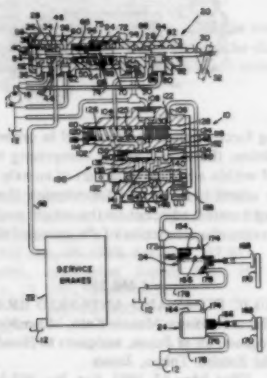
tappet being operative in said pump chamber to increase and decrease the pressure of the fluid therein, said tappet having a smaller diameter than said plunger, and spring means in said spring chamber acting on said plunger for resiliently biasing the same against said tappet.

4,456,311

HYDRAULIC BRAKE CONTROL AND VALVE THEREFOR

Kenneth E. Houtz, Streamwood, Ill., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 29, 1982, Ser. No. 363,192
Int. Cl.³ B60T *13/16*
U.S. Cl. 303—10 **9 Claims**



1. A brake control system for a vehicle, said vehicle having service and emergency brake systems comprising:

a fluid reservoir;

a hydraulic pump drawing fluid from said reservoir;

a first hydraulic actuating means operatively associated with said service brakes system;

a second hydraulic actuating means operatively associated with said emergency brake system;

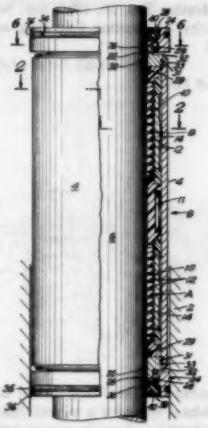
an externally actuable control valve including a variable pressure regulating portion having an inlet hydraulically connected to said hydraulic pump, a pressure outlet hydraulically connected to said service brake actuating means, and a spool controlling the pressure in said outlet; an externally controlled three-way valve portion having a control stem in axial alignment with said spool, an inlet hydraulically connected to said hydraulic pump, a pressure outlet hydraulically connected to said emergency brake means; and compression spring means disposed in said control valve between said stem and said spool such that external actuation of said stem loads said spool through said spring means, said three-way valve portion being configured to permit substantial travel of said stem for actuating said spool and said service brakes without effecting a change in state of said three-way valve portion and to subsequently switch said three-way valve portion to apply said emergency brake system, said emergency brake actuating means being configured to release said emergency brakes upon the application of hydraulic pressure thereto and apply said brakes in the absence of such pressure, said control valve three-way portion having an outlet to said reservoir, said three-way valve portion being normally disposed to provide a hydraulic connection through said stem between said inlet and said pressure outlet and, upon movement of said stem beyond said substantial travel, said three-way valve pressure outlet and said reservoir outlet are hydraulically interconnected through said stem.

4,456,312

COMBINATION OF ROTARY AND RECTILINEAR BEARING

Alfred M. Rogers, III, and Frank E. Carter, both of Huntington, N.Y., assignors to Thomson Industries, Inc., Manhasset, N.Y.

Filed Sep. 27, 1982, Ser. No. 424,259
Int. Cl.³ F16C *31/06*
U.S. Cl. 308—6 C **5 Claims**



1. A linear and rotary bearing adapted for use with a shaft which rotates and moves linearly relative to the bearing, comprising:

(a) a cylindrical casing;

(b) a plurality of closed circuit raceways having a straight track portion containing load carrying balls and a second straight track portion containing non-load carrying balls;

(c) load carrying plates operatively associated with said balls;

(d) hollow cylindrical means operatively associated with both ends of said casing, said hollow cylindrical means including an inner hollow cylindrical member and an outer hollow cylindrical member, said outer cylindrical member having a diameter slightly larger than the diameter of said casing, and

(e) said outer and inner cylindrical members each having grooves in opposed relation one to the other to form a track and anti-friction load bearing balls in said track to form rotary bearings at both ends of said casing.

4,456,313

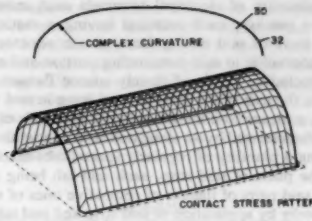
ROLLER BEARING WITH SPECIALLY CONSTRUCTED ROLLERS

Michael J. Hartnett, Woodbury; Chris J. Robinson, Winsted, and Edwin B. Tharp, Norfolk, all of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Sep. 16, 1982, Ser. No. 418,752
Int. Cl.³ F16C *33/36*
U.S. Cl. 308—202 **5 Claims**

1. In a roller bearing having an outer race and an inner race: a plurality of rollers, each roller having a longitudinal external surface having dimensions obtained by a computer which divides the roller along the roller-race contact length into a predetermined number of slices, locates a longitudinal point in

each roller slice, and determines the required diameter of the roller at each such longitudinal point to cause a uniform



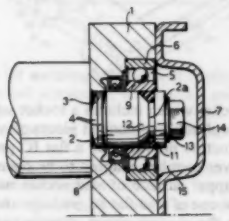
contact stress to be placed on each roller along the length of the roller within an acceptable error limit.

4,456,314

DEVICE FOR LOCKING THE INNER RING OF A ROLLING BEARING ON A ROTARY SHAFT

Pier P. Messori, Pino Torinese, and Pier L. Scapecchi, Saronno, both of Italy, assignors to Fiat Auto S.p.A., Turin, Italy

Filed Mar. 10, 1983, Ser. No. 473,917
Claims priority, application Italy, Mar. 10, 1982, 67297 A/82
Int. Cl.³ F16C *35/073*
U.S. Cl. 308—236 **1 Claim**



1. A support assembly for rotary members comprising a support structure, a shaft rotatably mounted in the support structure and a rolling bearing including an inner ring interposed between the support structure and said shaft wherein:

the rolling bearing is located adjacent one end of said shaft;

said one end of said shaft has a first portion with a diameter substantially equal to the internal diameter of said ring for accurately locating said bearing in centered condition on said first portion of said shaft, a second portion has a reduced diameter and a conical portion is disposed intermediate said first and said second portions;

a portion of said inner ring is mounted on said first portion of said shaft with the remaining portion extending coaxially with respect to said second reduced diameter portion to define an annular space;

a circular-sectioned sealing ring of elastomeric material is located in said annular space;

a washer of smaller diameter than the internal diameter of said inner ring is mounted on said second portion of said shaft; and

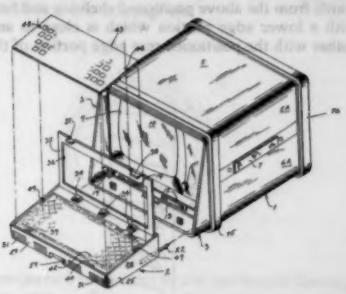
screw means engage said second portion of said shaft to lock said washer against said sealing ring and press said sealing ring into said space against said conical portion which forces said sealing ring outwardly into engagement with said inner ring to lock said inner ring onto said shaft.

4,456,315

INDUSTRIAL TERMINAL WITH ELASTIC BUMPERS

Theodore J. Markley, Mentor; Daniel J. Galdun, Huntsburg; Charles E. Clark, Eastlake; Robert G. Henderson, Wickliffe, and Frank W. Jencen, Cleveland, all of Ohio, assignors to Allen-Brsdley Company, Milwaukee, Wis.

Division of Ser. No. 075,175, Sep. 12, 1979. This application Dec. 14, 1981, Ser. No. 330,184
Int. Cl.³ A47B *81/06*
U.S. Cl. 312—137 **3 Claims**



1. A terminal for housing electronic circuitry and a cathode ray tube display, the combination comprising;

a bezel which defines an opening through which the cathode ray tube is viewed and which has an outer periphery that completely encircles said opening;

back means spaced from the bezel to define a cavity between them in which the cathode ray tube and electronic circuitry are contained, said back means having an outer periphery;

cover means which extends between the bezel and the back means and which encloses the cavity therebetween;

a forward bumper formed of a resilient material, said forward bumper being fastened to said bezel and being positioned to extend completely around its periphery; and

a rear bumper formed of a resilient material, said rear bumper being fastened to said back means and being positioned to extend completely around its periphery,

wherein the forward and rear bumpers provide resilient support for the terminal which spaces the cover means from a surface upon which the terminal may rest,

in which the forward bumper is fastened to the bezel by a mortise and tenon joint comprised of a tenon formed around the periphery of the bezel and a mortise formed on the underside of the forward bumper, and in which the rear bumper is fastened to the back means by a mortise and tenon joint comprised of a second tenon formed around the periphery of the back means and a second mortise formed on the underside of the rear bumper.

4,456,316

DEVICE FOR STORAGE OF SHOES AND SIMILAR

Bengt Lundgren, Skarviksvägen 46, S-430 94 Bohus Björkö, Sweden

Filed Sep. 23, 1981, Ser. No. 304,893
Int. Cl.³ A47B *77/06*
U.S. Cl. 312—229 **1 Claim**

1. Device for storage of shoes on a shelf, which comprises a plurality of shelvings positioned on top of each other for the support of the shoes and a back part positioned behind said shelvings, said shelvings being inclined so as to slope towards the back part, wherein said device comprises a front edge portion and a rear edge portion of each shelving, said portions being arranged to allow passage of removed particles from the shoes such as sand, dirt and the like, a chute positioned between said back part and said rear edge portions and extending

from the uppermost shelving and past the lowermost shelving, said chute allowing said removed particles to fall downwards, a container for collecting downfalling particles said container being positioned below said chute, and each shelving being provided with a stop means which is arranged to prevent the shoes to be placed on the shelving in such a manner that they extend into said chute, said stop means comprising a plate element protruding from above and forming a protection shield covering the major part of the area between the rear edge portion of the respective shelf and the above adjacent shelving, said plate element of each shelving extending downwards from the above positioned shelving and being provided with a lower edge portion which is close to and which together with the positioned rear edge portion of the respective

shelving delimits an opening through which the removed particles from the shoes and the like can pass into the chute, wherein the plate element extends inclined downwards towards said chute and the lower edge portion of the plate element is situated beside the rear edge portion of its respective shelving, mainly in level with the rear edge portion of its respective shelving, so that said opening from each shelving into the chute is directed downwards towards said container, and wherein substantially all the shelvings have their respective plate elements fixed to the rear edge portion of the shelving positioned thereabove, each of said shelvings and plate elements forming a continuous shielding unit, extending from the front edge portion of the shelving mainly to the level of the rear edge portion of the shelving positioned therebelow.

4,456,317

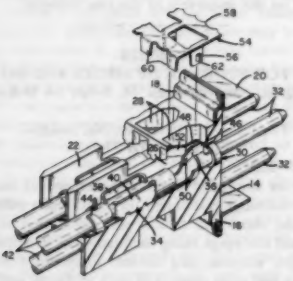
COMMONING STRIP

Earl W. McCleerey, Mechanicsburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 10, 1983, Ser. No. 473,885

Int. Cl.³ H01R *4/66, 31/08*

U.S. Cl. 339—14 R **4 Claims**



1. In combination with an electrical connector having a housing of rigid insulative material defining a mating face, an oppositely directed terminating portion, a plurality of terminal passages extending between said mating face and said terminating portion, and a transverse slot intersecting each said passage, a plurality of electrical terminals each mounted in a respective passage, each terminal having a mating portion directed towards said mating face and a conductor engaging portion accessible in said terminating portion and a retention portion including a pair of closely spaced flanges extending normal to the axis of the terminal and lying in said transverse aperture, a means to common selected terminals of said connector characterized by an elongated strip of conductive material having a plurality of regularly spaced tabs extending normal to the plane of said strip, each said tab being receivable between said pairs of flanges of respective ones of said terminals whereby by application of said strip and said tabs selected terminals can be interconnected.

4,456,318

IC SOCKET

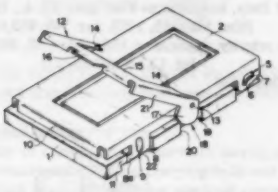
Suoji Shibata, Tokyo, and Shoji Umesato, Fuchu, both of Japan, assignors to Yamaichi Electric Mfg. Co., Ltd. and Nippon Electric Co., Ltd., both of Tokyo, Japan

Filed Aug. 11, 1982, Ser. No. 407,133

Claims priority, application Japan, Aug. 11, 1981, 56-125562

Int. Cl.³ H01R *23/68*

U.S. Cl. 339—17 CF **7 Claims**



1. In an IC socket which includes a socket substrate having planted therein a plurality of contact pieces on which an equal number of conductors provided on a flat IC package are disposed, and a cover member adapted to be opened and closed relative to the upper surface of said socket substrate and to press from above one of said flat IC package and said conductors disposed on the contact pieces, thereby causing the conductors to come into contact with the contact pieces, the improvement wherein:

said cover member is retained on said socket substrate so as to be laterally reciprocatively movable along the upper surface of said socket substrate; and

said IC socket comprises means for locking said cover member in said socket substrate by the lateral movement of said cover member in one direction to be retained in a closed state relative to said socket substrate and unlocking said cover member by the lateral movement of said cover member in the other direction to become in an openable state relative to said socket substrate;

said means including a rotary lever attached pivotally to said cover member so as to be pivotable about an axis of rotation in directions toward and away from said cover member and provided integrally with a pair of guide plates around said axis of rotation, each guide plate including a first guide portion and a second guide portion;

said socket substrate having a pair of first regulation walls and a pair of second regulation walls, said rotary lever being pivotable downward so as to bring the first guide portions of said guide plates into rotational engagement with said first regulation walls and being pivotable upward so as to bring the second guide portions of said guide plates into rotational engagement with said second regulation walls, said guide portions and said first and second regulation walls being so shaped that the distance from

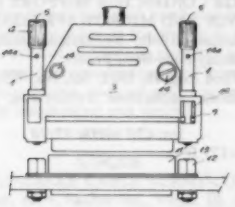
said axis of rotation to the location of engagement between said first guide portions and said first regulation walls increases with pivotal movement of said rotary lever toward said cover member, thereby to move said rotary lever and said cover member in said one direction to lock said cover member in said socket substrate, and that the distance from said axis of rotation to the location of engagement between said second guide portions said second regulation walls increases with pivotal movement of said rotary lever away from said cover member, thereby to move said rotary lever and said cover member in said other direction to unlock said cover member from said socket substrate.

4,456,319

APPARATUS FOR SECURING ELECTRICAL CONNECTORS

André Poulain Ricros, Avenida Diagonal, 381, Barcelona 8, Spain

Filed Jan. 20, 1982, Ser. No. 341,132
Claims priority, application Spain, Jan. 23, 1981, 256.161
Int. Cl.³ H01R *13/621*
U.S. Cl. 339—92 R **2 Claims**



1. Apparatus for securing an electrical connection box housing a first electrical connector, to a second electrical connector, comprising:

an electrical connection box having at least one bore formed therein;

at least one rod mounted in a respective bore formed in said electrical connection box so as to be freely rotatable therein, said rod having an annular groove formed therein, a first end projecting externally of said connection box and having a head accessible for rotating said rod, and a second end constituting a threaded stud adapted to be threadedly connected to an internal threaded member fixed to the second electrical connector; and

means for limiting the extent of axial displacement of said rod within said respective bore, which comprises:

guide means formed in said connection box in communication with said respective bore in which said rod is mounted and extending substantially parallel to said bore for a length which is shorter than the length of the bore in which said rod is mounted; and

a substantially Ω-shaped clip member mounted within said groove so as to be axially fixed and freely rotatable with respect to said rod, and having arms which extend laterally from said rod, pass into said guide means, and terminate at bent flanges adapted to run along said guide means.

4,456,320

SEALING RING FOR AN ELECTRICAL CONNECTOR

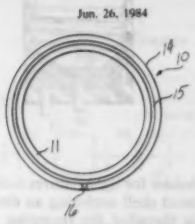
David O. Gallusser, Oneonta; David W. MacAvoy; Stephen Punako, both of Bainbridge, and David L. Frear, Afton, all of N.Y., assignors to The Bendix Corporation, Southfield, Mich.

Filed Jul. 28, 1982, Ser. No. 402,528
Int. Cl.³ H01R *4/00*
U.S. Cl. 339—94 M **3 Claims**

1. In combination with a separable electrical connector assembly of the type having first and second housings, each having a front face and separably connected together in face to face relationship by a coupling nut mounted on one of the housings, the improvement comprising:

a compressible annular member having a rear face, a forward face, an inner circumferential face and an outer circumferential face;

an annular groove in the rear face of said annular member, the forward face having an area less than the area of said rear face, said annular member located in said first housing with the annular groove located against and facing the front face of first said housing; and



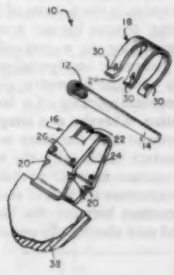
an annular projection in the front face of said second housing adapted to engage said compressible member upon connecting together the two housings, said projection having a radial width about the same as the diameter of the groove in said member so that said annular groove accepts material displaced by the projection in the forward face of said second housing when said housings are connected together and said projection is pressed into said annular member by rotation of said coupling nut.

4,456,321

TWO-PIECE, PUSH-ON TYPE GROUNDING CLIP

Philip N. Jones, Rustburg, and Tye C. Drinkard, Forest, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Apr. 19, 1982, Ser. No. 369,550
Int. Cl.³ H01R *4/24, 4/66*
U.S. Cl. 339—97 R **15 Claims**



1. A two-piece electrical connection clip for electrically connecting the electrically conductive shield of a shielded electrical cable to a first metallic member, said clip comprising:

a first electrically conductive metallic clamp formed by two members that are joined at a common end, said two members providing a first opening dimensioned to receive and engage therewithin an edge of said first metallic member, said common end having a slot dimensioned to receive and engage therewithin said conductive shield of said shielded electrical cable; and

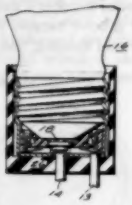
a second clamp dimensioned to engage said first clamp and to securely retain said conductive shield within said second opening.

4,456,322

LAMP WATTAGE LIMITING DEVICE

Frank A. L. Ferroni, 108 Chateau St. Michel Dr., Kenner, La. 70062

Filed Apr. 28, 1981, Ser. No. 258,297
Int. Cl.³ H01R *13/64, 17/20, 27/00*
U.S. Cl. 339—153 **8 Claims**



1. In a lamp holder for light fixtures including a lamp holder having an insulated shell enclosing an electrically conductive socket which is threaded for receiving a lamp in screw-in relationship, and further including a first electrical contact connected to the electrically conductive socket and a second electrical contact generally centrally located in the bottom of the lamp holder and insulated from the electrically conductive socket, a wattage limiting and safety device comprising an insulating ring assembly being hollow at its center and at least one spring member mounted in its periphery, said insulating ring assembly being positioned within the electrically conductive socket so as to rest at the bottom thereof with the at least one spring member having an upper and lower spring arm both extending towards the center of the electrically conductive socket, a contact member comprising an insulated carrier having an electrically conductive button centrally located thereon and having arm portions at its periphery, said contact member being insertable into the electrically conductive socket whereby the upper and lower spring arms of said at least one spring member capture the arm portions of said contact member between them to retain it within said socket, said lower spring arm mounting said contact member such that in an unbiased condition said electrically conductive button is aligned with but spaced from the second electrical contact generally centrally located in the bottom of the lamp base, said electrically conducting button having a selected geometric configuration corresponding to a particular lamp wattage rating, said selected geometric configuration corresponding in a mating relationship with the geometric configuration of the centrally located electrical contact of a lamp base of corresponding wattage rating, whereby as a lamp of corresponding wattage rating is screwed into the lamp socket, its centrally located electrical contact mates with the selected geometric configuration of the contact member so that continued screwing-in of said lamp overcomes the bias of said lower spring arm to make electrical contact between the lamp socket central electrical contact and said electrically conductive button.

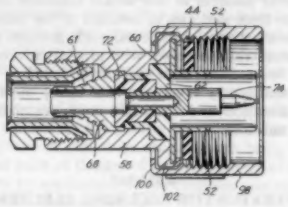
4,456,323

CONNECTOR FOR COAXIAL CABLES

William E. Pitcher, Bridgewater, Conn.; Peter W. Baione, East Meadow, and John A. Morelli, Coram, both of N.Y., assignors to Automatic Connector, Inc., Commack, N.Y.

Filed Nov. 9, 1981, Ser. No. 319,788
Int. Cl.³ H01R *17/18*
U.S. Cl. 339—177 R **5 Claims**

4. A plug sub-assembly for a coaxial cable connector formed of screw machine parts, the plug sub-assembly comprising a body having a stepped opening therethrough terminating in a flat front surface, a front counterbore formed in said flat front surface forming a front cavity, a one-piece insulator seated in the cavity, the one-piece insulator having a front flat surface with a central aperture therethrough enabling a center contact of said connector to pass therethrough, an outer contact electrically coupled and fixedly connected to the body, the outer contact having a flat rear flange bearing against the flat front



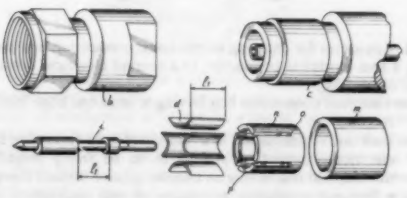
surfae of the body and the flat front surface of the insulator, the body comprising a forwardly disposed flange spun over the flat rear flange of said outer contact to capture the flange and outer contact.

4,456,324

INTERIOR CONDUCTOR SUPPORT FOR HIGH FREQUENCY AND MICROWAVE COAXIAL LINES

Hanspeter Staeger, Köniz, Switzerland, assignor to Radiall Industrie, Rosny-Sous-Bois, France

Filed Aug. 18, 1982, Ser. No. 409,309
Claims priority, application Switzerland, Aug. 20, 1981, 5370/81
Int. Cl.³ H01R *17/18*
U.S. Cl. 339—177 R **4 Claims**



1. A mechanically rigid support of an interior conductor for high frequency and microwave coaxial lines and connectors, characterized by the fact that it includes an exterior conductor element (n) having symmetry of revolution and at least four slits, and an interior conductor (i) of reduced section to maintain a constant characteristic impedance over the length of the support, the interior conductor being automatically centered and immobilized longitudinally by at least four small elastic dielectric plates (d) preformed in convex shape with respect to the median axis and introduced in the slits of the exterior conductor element (n).

4,456,325

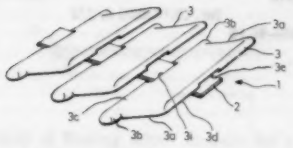
ELECTRICAL CONNECTION DEVICE

Reinhard Benz, Basel, Switzerland, assignor to Sotax AG, Basel, Switzerland

Continuation of Ser. No. 241,742, Mar. 9, 1981, abandoned. This application Oct. 20, 1983, Ser. No. 543,783
Claims priority, application Switzerland, Mar. 13, 1980, 1969/80
Int. Cl.³ H01R *4/28*
U.S. Cl. 339—256 RT **12 Claims**

10. An electrical connection device for production of an electrically conductive connection between two juxtaposed contact bodies, the device comprising a plurality of conductor members of electrically conductive material arranged in at

least one row; resilient means of a different material connecting said conductor members together; each of said conductor members being so arranged that, in plan projection thereof from a plane in which it has the greatest area, it protrudes outwardly of said resilient means and is in constant contact therewith over an area which is at most 75 percent of the entire area of the member in said projection; said resilient means including a strip portion extending in the longitudinal direction of said row and a plurality of pairs of tongue elements laterally



projecting from said strip portion, each of said pairs of tongue elements being attached to a respective one of said conductor members, and each of the tongue elements of each pair extending from a respective one of two opposite sides of said strip portion, the tongue elements of each pair being attached to the respective conductor member at the free ends of the tongue elements, and portions of said tongue elements and of the strip portion between said free ends being spaced from said conductor member; and wherein each of said tongue elements is twisted about the longitudinal axis thereof.

4,456,326

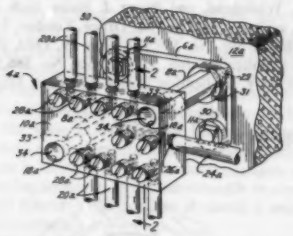
WALL MOUNTABLE CABLE TERMINAL BLOCK

Charles J. Sauber, 10 N. Sauber Rd., Virgil, Ill. 60182

Continuation-in-part of Ser. No. 405,060, Aug. 4, 1982, abandoned. This application Mar. 7, 1983, Ser. No. 473,073

Int. Cl.³ H01R *4/36*; H02B *1/02*

U.S. Cl. 339—272 A **4 Claims**



1. A wall mountable electric cable terminal comprising, in combination, a mounting plate having first means defining openings for receiving mounting fasteners, a pair of openings having threaded means associated with said plate, a pair of insulated rod means with first and second ends, said first ends having longitudinally extending threaded end means for securement to said plate threaded means and said second ends having cap means, a conductive block member having countersunk openings for receiving said cap means on said second ends of said insulated rod means to secure the block to the rod means, said cap means being fixed to said rod means to provide insulated rod means permanently attached to said block but freely rotatable with respect to said block and said block with rod means being adapted to be affixed to the mounting plate threaded means by rotation of the rod means, said block having a plurality of inwardly extending side openings for receiving insulation stripped ends of cable and the face of said block including threaded ports communicating with each of said cable receiving openings and carrying set screw means for holding the cable ends to the block.

4,456,327

EXTENSIVE FIELD CAMERA

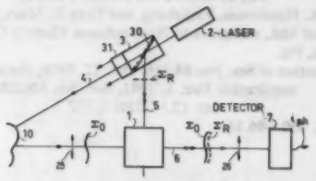
Jean P. Huignard, and Marcel Malard, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 28, 1981, Ser. No. 258,314

Claims priority, application France, May 8, 1980, 80 10246

Int. Cl.³ G03H *1/26*

U.S. Cl. 350—3.6 **7 Claims**



1. A field camera system intended for the real time analysis of the image of an object, comprising:

a coherent radiation source means supplying an illumination beam of the object and a pumping beam;

optical means, including an interaction medium, for receiving said pumping beam and an imaged reflected beam resulting from said illumination beam of the object whereby said imaged reflected beam and said pumping beam interfere in said interaction medium in which the spatial modulation of the light intensity resulting from interference fringes produced by said interference gives rise to a spatial modulation of the refractive index in said medium with a system of layers resulting from said refractive index spatial modulation creating by partial diffraction of the pumping wave a wave front isomorphic to the wave front of said imaged reflected beam.

4,456,328

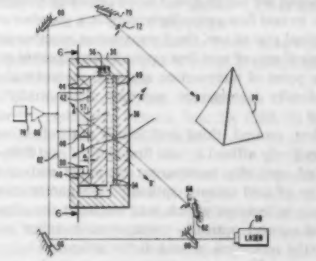
SYSTEMS FOR FORMING IMPROVED DIFFUSION HOLOGRAMS

James A. Arns, Culver City; Timothy J. Edwards, Hermosa Beach; Gaylord E. Moss, Marina del Rey, and John E. Wreede, Monrovia, all of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Jun. 1, 1981, Ser. No. 269,105

Int. Cl.³ G03H *1/02*

U.S. Cl. 350—3.6 **14 Claims**



1. A system for recording, from first and second beams, a diffusion type hologram, said system comprising: a recording structure including a recording medium positioned between first and second plates which are transparent to beams diffused from an object to which said first beam is applied and transpar-

ent to said second beam, and including an index matching fluid retained between said first and second plates;

transducer means coupled to at least one plate for moving said plate; and

control means coupled to said transducer means for controlling said transducer means to move said plate coupled thereto during a recording period to inhibit formation of spurious hologram recordings.

4,456,329

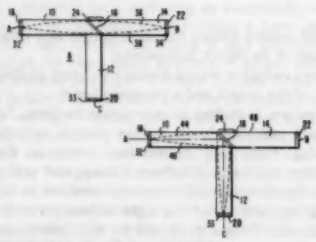
OPTICAL DEVICE HAVING MULTIPLE WAVELENGTH DEPENDENT OPTICAL PATHS

James A. Henderson, Finksburg, and Gary E. Marx, Sykesville, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Continuation of Ser. No. 84,216, Oct. 12, 1979, abandoned. This application Dec. 1, 1981, Ser. No. 326,235

Int. Cl.³ G02B 5/172

U.S. Cl. 350—96.16 7 Claims



1. An optical system comprising

(a) a wavelength dependent multipath optical transmission device having at least first and second optical paths therethrough, including;

(1) first and second optically transparent members each having an optical axis, a substantially square cross section and first and second ends;

(2) a dichroic layer positioned between said second ends of said first and second members such that said optical axes of said first and second members are positioned end to end and substantially parallel with respect to each other, with said dichroic layer being positioned at an angle of substantially forty-five degrees with respect to said optical axes of said first and second optically transparent members;

(3) a third optically transparent member having an optical axis, having first and second ends and a substantially square cross section;

(4) means for affixing said third optically transparent member to said first optically transparent member such that the optical axis of said third transparent member intersects the optical axis of said first optically transparent member with the point of intersection and said second end of said first optically transparent member substantially coinciding; and

(5) first, second, third and fourth anti-reflective layers respectively affixed to said first ends of said first, second and third optically transparent members and to the longest edge of said second optically transparent member to reduce reflections which may occur at the edge surface of said second optically transparent member as a result of partial reflection at said dichroic layer;

(b) an optical fiber coupled to receive optical energy from and couple optical energy to said first optically transparent member;

(c) transmitting means for generating an optical beam and coupling said optical beam to said optical fiber via one of said wavelength dependent paths; and

(d) receiving means coupled to receive optical energy from said optical fiber via a second one of said wavelength dependent optical paths.

4,456,330

OPTICAL COUPLING SYSTEM AND METHOD FOR MANUFACTURING SAME

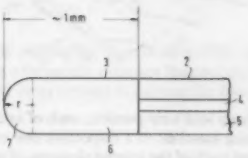
Wolfgang Blüdau, Gerlingen, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jan. 18, 1982, Ser. No. 339,925

Claims priority, application Fed. Rep. of Germany, Jan. 17, 1981, 3101378

Int. Cl.³ G02B 5/172

U.S. Cl. 350—96.18 6 Claims



1. An optical coupler and a generally cylindrical fiber-optic waveguide having a substantially planar end face, said optical coupler comprising a homogenous silica rod having a generally cylindrical portion having a length y and a diameter substantially equal to the diameter of said generally cylindrical waveguide, said homogenous silica rod having a substantially planar end face at one end fused to the substantially planar end face of said fiber-optic waveguide, a hemispherical lens surface formed at the other end of said homogenous silica rod having an axial length between a range of r and $\frac{1}{2}r$, y+r being greater than the diameter of said fiber-optic waveguide.

4,456,331

IMPROVED COMMUNICATIONS CABLE WITH LINES OF WEAKNESS

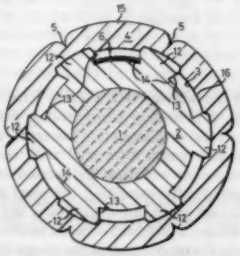
Graham K. Whitehead, and Roger J. Bates, both of Ipswich, England, assignors to The Post Office, London, England

Continuation of Ser. No. 150,922, May 19, 1980, abandoned. This application Jun. 9, 1982, Ser. No. 386,524

Claims priority, application United Kingdom, May 22, 1979, 7917767

Int. Cl.³ G02B 5/16

U.S. Cl. 350—96.23 4 Claims



1. In a communications cable comprising a core, a plurality of ribs extending along the core, channels defined between the ribs each of which is dimensioned to contain a layer of optical fibers running along the outer peripheral surface of the core and an external sheath covering the core the improvement of indentations providing lines of weakness extending longitudinally directly over the ribs defining the channels thereby rendering a channel and the fibers in it accessible by cutting along

adjacent indentations to said ribs and removing the sheath section between the cuts.

4,456,332

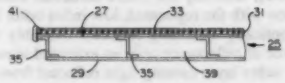
METHOD OF FORMING STRUCTURAL HELIOSTAT

Alfred J. Anderson, Littleton, Colo., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Continuation-in-part of Ser. No. 138,207, Apr. 7, 1980, Pat. No. 4,373,783. This application May 26, 1981, Ser. No. 266,991

Int. Cl.³ G02B 5/08

U.S. Cl. 350—320 **10 Claims**



1. A method of forming mirror modules for a heliostat, having a main support structure, for reflecting solar energy onto a collector comprising the steps of

a. forming a solid, rigid bed of predetermined configuration and dimensions and having at least one planar section adapted to receive a planar mirror facet;

b. emplacing at least one mirror facet on said bed section downwardly to expose the backside surface of said mirror facet;

c. applying to said backside surface a thin layer of a silicone grease, said layer having a thickness in the range of 0.001 inch–0.005 inch;

d. forming a mirror backing sheet of desired dimensions to cover the backside surface of said at least one mirror facet and support said mirror facet;

e. applying to a front side of said mirror backing sheet a thin layer of said silicone grease, said layer having a thickness in the range of 0.001 inch–0.005 inch;

f. applying the greased front surface of said mirror backing sheet to the greased backside surface of said mirror by flexing said backing sheet and progressively and simultaneously applying and rolling from one end edge thereof to substantially eliminate air bubbles until the entire backing sheet is firmly applied to said at least one mirror facet;

g. forming a substrate assembly by affixing a back sheet to respective internal support structure; said internal support structure having sufficient rigidity to support said mirror cantilevered from the main support structure of the heliostat and to withstand predetermined loads; said back sheet having the same co-efficient of thermal expansion and contraction as said mirror backing sheet such that no curvature is induced by temperature changes; said back sheet having adequate structural strength in combination with said mirror backing sheet to stabilize said internal support structure;

h. adhesively bonding said substrate assembly to said mirror backing sheet

whereby there is formed a mirror module that prevents fluttering of said mirror with respect to said mirror backing sheet and to protect the mirror backside against the adverse effects of weather and eliminate curvature induced by temperature changes.

4,456,333

SIDE VIEW MIRROR FOR VEHICLES

Delbert C. Hewitt, P.O. Box 365, Wilsonville, Oreg. 97070

Filed Mar. 15, 1982, Ser. No. 358,520

Int. Cl.³ G02B 7/18, 5/08

U.S. Cl. 350—289 **5 Claims**

1. A side view mirror for vehicles of the type arranged to be attached to supporting brackets on the vehicle, comprising

(a) an upright mirror housing having a rear wall portion, top and bottom wall portions, and a mirror on the front thereof,

(b) upright rod means in said housing projecting through said top and bottom wall portions,

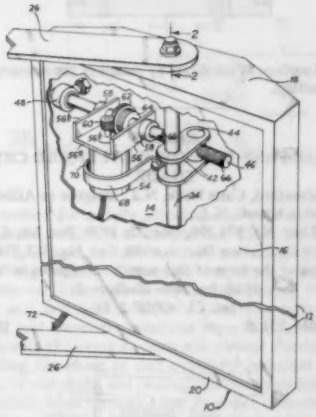
(c) support means on said rod means pivotally supporting said housing on said rod means,

(d) securing means on said rod means arranged to secure said rod means non-rotatably on the supporting brackets of a vehicle,

(e) a radially projecting arm secured integrally to said rod means between the ends of the latter,

(f) a cross shaft in said housing,

(g) bearing means secured to said housing and supporting one end of said shaft,



(h) threaded connecting means connecting said shaft to said radially projecting arm and providing support for the other end of said shaft,

(i) reversible drive motor means in said housing having a rotatable output,

(j) and drive connecting means connecting said rotatable output of said motor to said arm on said rod means whereby upon operation of said motor it is arranged to rotate said frame relative to said rod means to provide adjustment of the mirror.

4,456,334

PROCESS FOR ALIGNING AN OPTICAL FIBER FORMING PART OF AN OPTICAL TRANSMISSION CABLE WITH AN OPTO-ELECTRONIC COMPONENT, AN ADAPTER, AND A COUPLING HEAD COMPRISING USE OF THE PROCESS

Raymond Henry; Jacques Simon; Danièle Levy; Jean-Francois Carpenter, and Bernard Defaut, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 22, 1981, Ser. No. 304,606

Claims priority, application France, Sep. 23, 1980, 80 20411

Int. Cl.³ G02B 7/26

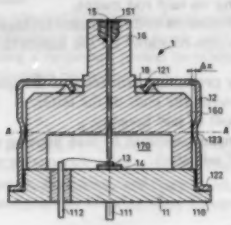
U.S. Cl. 350—320 **8 Claims**

1. In a process for aligning a glass fiber with an opto-electronic component in a case where the glass fiber is a fiber portion incorporated in a fiber-holder forming part of an opto-electronic head, which fiber portion presents, on the opto-electronic component side, a flat input or output face for the light, and said component is a semiconductor diode fixed to a base and presenting a useful light-emission or reception surface, the improvement comprising the steps of:

forming said head with a permanently deformable part between said fiber-holder and said base;

applying external means at the periphery of said deformable part, while exerting pressures capable of producing per-

manent deformations and simultaneously checking the alignment of the flat face of the fiber section with the



useful surface of the diode by means of the amount of light transmitted.

4,456,335

THERMAL-PANE WINDOW WITH LIQUID CRYSTAL SHADE

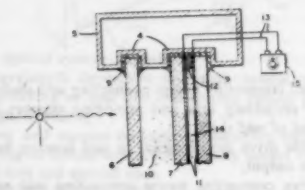
Robin B. Mumford, Colts Neck, N.J., assignor to Allied Corporation, Morristown, N.J.

Division of Ser. No. 971,298, Dec. 20, 1978, Pat. No. 4,268,126. This application Dec. 5, 1980, Ser. No. 213,274

The portion of the term of this patent subsequent to May 19, 1998, has been disclaimed.

Int. Cl.³ G02F 1/13

U.S. Cl. 350—331 R **10 Claims**



1. A method for decreasing radiative and conductive heat transfer between the exterior and the interior of a building, comprising the steps of:

(a) mounting within a window frame, a plurality of spaced window panes;

(b) delimiting between said window panes a first space providing a thermal break and a second space containing an electro-optical liquid crystal cell providing a selected light transmittance.

4,456,336

HIGH BRIGHTNESS INTERNAL REFLECTOR FOR LIQUID CRYSTAL DISPLAYS AND ITS METHOD OF FABRICATION

Chi H. Chung; Sun Lu, both of San Jose, and David B. Chung, Alhambra, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

PCT No. PCT/US82/01442, 371 Date Oct. 5, 1982, 102(e) Date Oct. 5, 1982, PCT Pub. No. WO83/01310, PCT Pub. Date Apr. 14, 1983

Continuation-in-part of Ser. No. 308,991, Oct. 6, 1981, abandoned. This PCT application Oct. 5, 1982, Ser. No. 433,026

Int. Cl.³ G02F 1/13

U.S. Cl. 350—338 **20 Claims**

1. A liquid crystal display device including at least a top and bottom cover plate spaced apart from each other and having at least one electrode selectively disposed on the inner surface of each plate, a liquid crystal composition filling the space therebetween and in contact with a least one electrode on each plate such that an electrical potential applied to such electrodes effects a change in the optical state of the liquid crystal material located between the electrodes, said device further including a reflector assembly positioned between the plates, said reflector assembly comprising

a substrate having a micro-lenticular surface, a reflective structure overlying and substantially replicating the micro-lenticular surface, and light transparent, low index outer organic layer overlying the reflective structure and also substantially replicating the micro-lenticular surface and in contact with the liquid crystal composition, which outer layer has an index of refraction not greater than that of SiO_2, whereby the micro-lenticular surface, in combination with the replicated, low index outer layer results in an optically spreading reflector assembly having a high decree of reflectance over an extended viewing angle, the low index layer causing light reflected from the reflective structure and reaching the outer surface of the cover plate at greater than the critical angle at that surface whereat it would be totally internally reflected, to be redirected such that some of the light reaches that surface at less than the critical angle, thus allowing more light to pass out of the device.

12. In a liquid crystal display device including a liquid crystal composition disposed between two spaced plates, one of which is a light transparent front plate, and other of which is an electrically insulating rear plate, the improvement comprising:

said rear plate having on the inner surface thereof a micro-lenticular surface,

said micro-lenticular surface having deposited thereon a layer of light reflective material which replicates the micro-lenticular surface, and

said light reflective material having deposited thereon an

organic layer of light transparent material, the outer surface of which also replicates the micro-lenticular surface and is in optical contact with said liquid crystal composition, the index of refraction of said transparent material being not greater than that of SiO_2.

13. A liquid crystal display device comprising

(a) an enclosure containing a liquid crystal material therein;

(b) a front window for passing light into the enclosure to be preferentially reflected therefrom, having substantially transparent electrode covering at least a portion of the inner surface of the window, and

(c) at least one rear electrode adjacent a rear portion of the enclosure and separated by the liquid crystal material from the transparent electrode, said electrodes being adapted to allow application of an electric potential therebetween to thereby polarize the liquid crystal material to selectively alter the reflectivity thereof, characterized by a reflector structure positioned between said at least one electrode and said liquid crystal material, said structure including a

(i) substrate having a micro-lenticular, substantially optically spreading surface thereon,

(ii) a layer of light reflective material overlying and conforming to said micro-lenticular surface for providing a substantially optically spreading reflectorized surface, and

(iii) an organic layer of a light transparent material overlying the layer of the light reflective material and in optical contact therewith, said light transparent material having an index of refraction not greater than that of SiO_2 whereby the optically spreading reflectorized surface in combination with the layer of low index material results in a high degree of reflection over an extended viewing

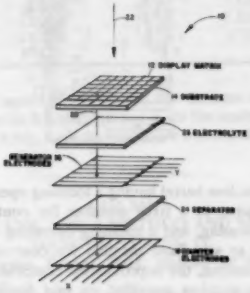
angle within which total internal reflection at the outer surface of the front window does not occur, thus extending the useful viewing angle of the display device.

4,456,337

CHEMICALLY COUPLED COLOR-CHANGING DISPLAY

Margie M. Nicholson, San Marino, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 7, 1981, Ser. No. 327,856
Int. Cl.³ G02F 1/23
U.S. Cl. 350—357 **14 Claims**



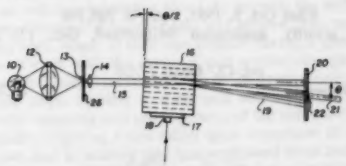
1. A display device, comprising:
an electronically isolated element of a solid, insoluble display material capable of reversibly changing color by reaction with soluble reactants; and
drive means for electrochemically generating said soluble reactants.

4,456,338

ELECTRONICALLY TUNEABLE LIGHT SOURCE

Daniel Gelbart, Burnaby, Canada, assignor to MacDonald Dettwiler & Associates Ltd., Richmond, Canada

Continuation-in-part of Ser. No. 240,998, Mar. 5, 1981, abandoned. This application Jan. 29, 1982, Ser. No. 343,777
Int. Cl.³ G02F 1/11
U.S. Cl. 350—358 **9 Claims**



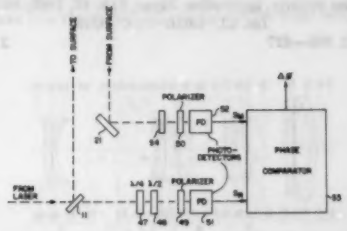
1. An electronically tuneable light source comprising;
(a) a source of white light;
(b) an acousto-optic modulator having a transparent medium;
(c) means for generating an acoustical travelling wave in said medium;
(d) means for collimating light from said source and directing the collimated beam of said white light onto said medium at a pre-selected angle $\theta/2$ to the perpendicular to the direction of travel of the acoustic wave whereby said beam is diffracted by the acoustic wave;
(e) means for selecting a band of the diffracted beam the midpoint of which band is at an angle of approximately θ to the direction of incidence of the collimated beam.

4,456,339

LASER HETERODYNE SURFACE PROFILER

Gary E. Sommargren, Livermore, Calif., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 159,893, Jun. 16, 1980, Pat. No. 4,353,650. This application Jun. 29, 1982, Ser. No. 393,257
Int. Cl.³ G02F 1/01
U.S. Cl. 350—403 **4 Claims**



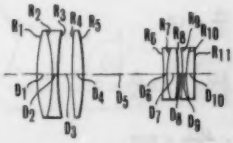
1. A method for initially adjusting a phase comparator for a desired initial condition of the phase of a first plane-polarized light beam along a first path with respect to a second plane-polarized light beam of the same frequency along a second path different from said first path comprising the steps of placing said first light beam in a circularly polarized form, directing said circularly polarized beam through a half-wave plate capable of having its optic axis rotated through an angle for shifting the phase of said circularly polarized beam as a function of said angle, and passing said circularly polarized and phase-shifted beam through a first polarizer, detecting the light passed by said first polarizer to produce at a first detector a first electrical signal having a phase that depends on the orientation of said half-wave plate, passing said second beam through a second polarizer to produce at a second detector a second electrical signal having a phase that depends on the phase of said second beam, comparing the phase of the two electrical signals thus produced, and rotating said half-wave plate to bring two electrical signals into the desired initial condition of being in phase.

4,456,340

OPTICAL SYSTEM FOR FOCAL LENGTH CONVERSION

Keiji Ikemori, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,589
Claims priority, application Japan, Nov. 13, 1980, 55-159905
Int. Cl.³ G02B 15/12
U.S. Cl. 350—422 **5 Claims**



1. An optical system of which the focal length is converted by attaching a negative lens system having a negative refractive power to a positive lens system having a positive refractive power in between said positive lens system and an image plane, having the following conditions:
the front principal point of said negative lens system lies on the image side of the rear principal point thereof, and on the image side of the rear principal point of said positive lens system; and

the overall length of said negative lens system being longer than 0.1 times and shorter than 0.5 times the back focus of said positive lens system.

4,456,341

ZOOM OBJECTIVE

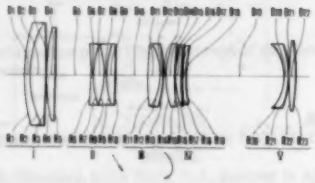
Masatake Kato, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 9, 1982, Ser. No. 347,195

Claims priority, application Japan, Feb. 16, 1981, 56-21131

Int. Cl.³ G02B 9/64, 15/18

U.S. Cl. 350—427 **2 Claims**



1. A telephoto zoom objective having the following various conditions:

having five lens groups, from front to rear,

the 1st lens group having a positive refractive power and being movable for focusing,

the 2nd group having a negative refractive power and being movable for varying magnification,

the 3rd group having a positive refractive power and being movable for compensating for the image shift caused when changing the image magnification,

the 4th group being fixed and having, from front to rear, two lenses of positive refractive power convex towards the front and a lens of negative power, and

the 5th group being fixed and having a meniscus lens of negative power convex towards the rear and a lens of positive power, and wherein letting f4 denote the focal length of the aforesaid 4th group, f5 the focal length of the aforesaid 5th group, f_R the overall focal length of the aforesaid 4th and the aforesaid 5th groups, D17 the axial air separation between the rear side lens of positive power and the lens of negative power in the aforesaid 4th group, f41 the focal length of the front side lens of positive power in the aforesaid 4th group, R14 and R15 the radii of curvature of the front and rear surfaces of the same lens respectively, and

R18 and R19 the radii of curvature of the front and rear surfaces of the lens of negative power in the aforesaid 4th group, the following conditions are satisfied:

$$0.7 < \frac{f_4}{f_R} < 1.0$$

$$1.0 < \left|\frac{f_5}{f_R}\right| < 3.9, \frac{f_5}{f_R} < 0$$

$$0.006 < \frac{D17}{f_R} < 0.05$$

$$1.0 < \frac{f_{41}}{f_4} < 1.5$$

$$1.5 < \left|\frac{R14 + R15}{R14 - R15}\right| < 2.6, \frac{R14 + R15}{R14 - R15} < 0$$

$$1.4 < \frac{R18 + R19}{R18 - R19} < 4.5$$

4,456,342

ZOOM LENS BARREL CAPABLE OF CLOSE UP PHOTOGRAPHY

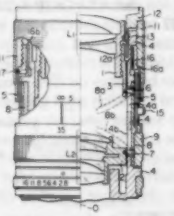
Takeshi Muryoi, Chigasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 2, 1981, Ser. No. 308,035

Claims priority, application Japan, Oct. 11, 1980, 55-142264

Int. Cl.³ G02B 15/18

U.S. Cl. 350—430 **7 Claims**



1. In a zoom lens barrel having a focusing operating member movable relative to a fixed member for controlling a lens system for focusing, and a zooming operating member movable relative to said fixed member for controlling said lens system for zooming, the improvement comprising:

a blocking member provided on said fixed member and operable to move between a first position and a second position;

said blocking member, when at said first position, blocking movement of said focusing operating member so as to prevent focusing of said lens system with respect to an object at a distance shorter than a predetermined distance, and said blocking member, when at said second position, blocking movement of said zooming operating member so as to prevent zooming at focal lengths beyond a predetermined focal length of said lens system.

4,456,343

HIGH SPEED CATADIOPTRIC OBJECTIVE LENS SYSTEM

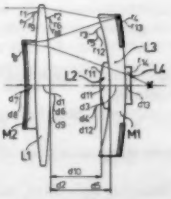
Ludvik Canzek, Quellmattstrasse 3, 5035 Unterentfelden, Switzerland

Filed Oct. 5, 1981, Ser. No. 308,798

Claims priority, application Switzerland, Oct. 17, 1980, 7753/80

Int. Cl.³ G02B 17/08

U.S. Cl. 350—444 **5 Claims**



1. A high speed objective system lens with a first single lens (L1), a main mirror lens (M1), a counter mirror lens (M2) and a field lens system composed of an unsilvered central portion (L3) of the main mirror lens (M1) and lenses (L2, L4), wherein the elements of the system referred to have the following numerical values:

F/1.2 f= 99.861 s' = 6.785

	Face No.	Radius r	Thickness d	n_d	ν_d
L_1	1	340.785	6.5	1.5168	64.2
	2	−375.235	36		
M_1	3	−120.616	8	1.5168	64.2
	4	−215.820	−8	1.5168	64.2
	5	−120.616	−36		
	6	−375.235	−6.5	1.5168	64.2
M_2	7	340.785	−	1.5168	64.2
	8	−1316.482	4	1.5168	64.2
	9	340.785	6.5	1.5168	64.2
	10	−375.235	33		
L_2	11	41.443	3	1.5168	64.2
L_3	12	−120.616	8	1.5168	64.2
L_4	13	−215.820	2	1.72825	28.4
	14	379.752			

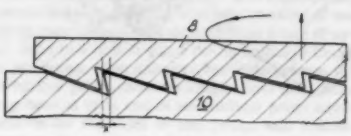
where F is the speed of the system, f is the focal length of the system, s' is the back focal distance, L_3 is the central portion of the main mirror M_1, n_d is the refractive index and ν_d is Abbe's number.

4,456,344

FRESNEL LENS, AND A METHOD AND MOLD FOR MANUFACTURING IT

Abramo Bordignon, Senago, Italy, assignor to A.T.B. S.p.A., Senago, Italy

Filed Sep. 29, 1981, Ser. No. 307,127
Claims priority, application Italy, Jul. 23, 1981, 23098 A/81
Int. Cl.³ G02B 3/08
U.S. Cl. 350—452 **1 Claim**



1. A method for manufacturing a Fresnel lens with a groove pattern in the form of a groove having the shape of a continuous spiral having a center and turns surrounding said center, said groove having a side wall forming an angle of less than 90° with respect to the main lens surface extension thereby defining an undercut formation along the groove, the method comprising the steps of molding said lens between two mold halves facing each other, at least one thereof having a pattern in the form of a rib with the shape of said continuous spiral groove and with a lateral surface having an inclination corresponding to said angle thereby to form said undercut, the spiral rib thereby engaging said spiral groove of the lens molding with a mutually snapping relationship upon formation of said spiral groove, and separating said lens so formed from said spiral rib presenting mold half by performing a relative rotation between said lens and said spiral rib presenting mold half and withdrawing the lens from the mold.

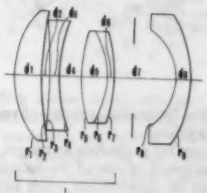
4,456,345

THIN TYPE PHOTOGRAPHIC LENS SYSTEM

Kazuo Fujibayashi, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 218,123, Dec. 19, 1980, abandoned. This application May 9, 1983, Ser. No. 491,785
Claims priority, application Japan, Dec. 25, 1979, 54-168560
Int. Cl.³ G02B 9/34, 15/14
U.S. Cl. 350—469 **7 Claims**

1. A photographic objective lens system consisting of:
positive meniscus lens means of forward convexity, bi-concave lens means arranged toward the image end of said positive meniscus means, biconvex lens means arranged toward the image end of said bi-concave lens means, and negative meniscus lens means of forward concavity arranged toward the image end of said bi-convex lens means,
said positive meniscus lens means, said bi-concave lens means, and said bi-convex means being arranged for movement along a common optical axis for effecting focusing of said photographic lens system,
said lens means having surfaces satisfying the following:
$2.2 < r_2/r_1 < 3.8$
where r_1 is the radius of curvature of the front surface of



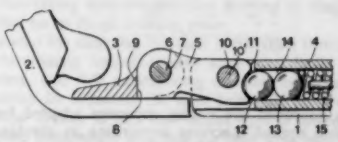
the positive meniscus lens and r_2 is the radius of curvature of the rear surface of the positive meniscus lens;
said negative meniscus lens means having at least one aspheric surface, and wherein
$0.6 < |f_A|/f < 1.0$, $f_A < 0$
where f is the focal length of the entire system and f_A is the focal length of the air lens formed between the positive meniscus lens means and the bi-concave lens means,
said lens means satisfying the following conditions:
$0.6 < r_5/r_4 < 1.2$
where r_4 is the radius of curvature of the rear surface of the bi-concave lens means and r_5 is the radius of curvature of the front surface of the bi-concave lens means.

4,456,346

HINGE FOR SPECTACLES

Karl Beyer, Geneva, Switzerland, assignor to La Nationale S.A., Geneva, Switzerland

PCT No. PCT/CH81/00032, 371 Date Nov. 25, 1981, 102(e) Date Nov. 25, 1981
PCT Filed Mar. 25, 1981, Ser. No. 328,583
Claims priority, application Switzerland, Mar. 26, 1980, 2368/80; European Pat. Off., Mar. 25, 1981, 81/810-088-5
Int. Cl.³ G02C 5/14, 5/16
U.S. Cl. 351—153 **3 Claims**



1. A hinge for spectacles comprising first and second hinging parts characterized in that it comprises a detachable intermediate part including means for rigidly attaching it to said first part, said intermediate part having a hole therein, a pivot member fitted in said hole and connecting said intermediate part to said second part, said intermediate part including a cam, said second part including an elastic element cooperating with said cam to provide an elastic hinge.

4,456,347

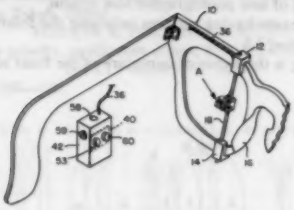
METHOD AND APPARATUS FOR FACILITATING RELAXATION

Frederick A. Stahly, Rochester, N.Y., assignor to Limbic Training Systems, Inc., Boulder, Colo.

Filed Aug. 17, 1981, Ser. No. 293,619

Int. Cl.³ G02C *1/00*

U.S. Cl. 351—158 **10 Claims**



5. Apparatus for facilitating psycho-physical relaxation by an individual comprising

monitoring means for providing an output responsive to the saccadic movement of one of the individual's eyes;

detection means for determining when any such eye movement exceeds a predetermined amplitude; and

transducer means for producing a signal sensible to the individual and indicative of an eye movement exceeding the predetermined amplitude.

4,456,348

APPARATUS FOR EXAMINING EYES

Kurt Schulz, and Peter Maglica, both of Oberkochen, Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

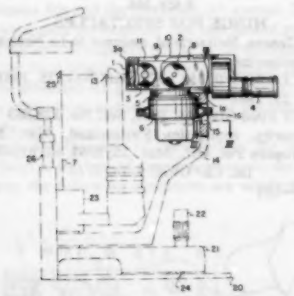
PCT No. PCT/DE 80/00003, § 371 Date Oct. 16, 1980, § 102(e) Date Oct. 6, 1984, PCT Pub. No. WO80/01642, PCT Pub. Date Aug. 21, 1980

This PCT application filed Jan. 12, 1980, Ser. No. 197,982

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1979, 2905915

Int. Cl.³ A61B *3/10*

U.S. Cl. 351—212 **4 Claims**



1. An improved eye testing apparatus adapted for interchangeable optical functions comprising in combination a binocular telescope magnifier and an ophthalmological examining instrument, wherein the main objective lens of the binocular telescope magnifier is positioned in a mount having a rectangular circumference, said mount being adapted to pivot about a horizontal axis to a first and second predetermined position said horizontal axis being orthogonal to the optical axis, and said first predetermined position being such that the optical axis of said main lens is aligned with the optical ray path, said second predetermined position being such that said main objective lens is displaced rectangularly upward and out of its position of alignment, said mount being provided with a connection means for the detachable connection of the ophthalmological instrument, said ophthalmological instrument being positioned such that in the second predetermined position its optical axis is axially aligned with the optical ray path; said mount being further provided on its upper side with a two-piece protective cover, each piece of said cover being pivotable about a horizontal axis such that the first piece of said two-piece protective cover may be displayed upwardly such that the second piece of said two-piece cover overlies and protects the main objective lens when said mount is in the second predetermined position.

4,456,349

CINEMATOGRAPHIC CAMERA

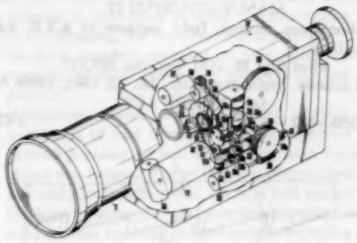
Noritsugu Hirata, Kanagawa; Hidekazu Okajima, Tokyo; Tomoshi Takigawa, Tokyo; Toshikazu Ichiyanagi, Tokyo, and Hiroyuki Takimoto, Saitama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 832,061, Sep. 9, 1977, abandoned. This application Jan. 29, 1980, Ser. No. 116,387

Claims priority, application Japan, Sep. 9, 1976, 51-108310; May 7, 1977, 52-52533

Int. Cl.³ G03B *9/26, 21/36*

U.S. Cl. 352—91 C **7 Claims**



1. A motion picture camera comprising:

(a) a film transporting motor;

(b) a rotary shutter having a shutter opening and rotating to an exposure opening, further making an exposure on a film when the shutter opening is at a position to pass over the exposure opening, while stopping the exposure on the film when the shutter opening passes over the exposure opening, whereby the shutter opening passes over the exposure opening every time the rotary shutter makes one rotation, thus effecting an exposure with an amount of light regulated by the shutter opening;

(c) an auxiliary shutter arranged to make a reciprocating movement against the exposure opening, shifting alternately from a non-shielding position where it does not shield the exposure opening to a shielding position where it shields the exposure opening during the reciprocating movement;

(d) a light measuring circuit for producing an output corresponding to the brightness of an object being photographed; and

(e) a regulating circuit fro driving the auxiliary shutter as its first operation before the shutter opening of the rotary shutter is shifted to a position passing over the exposure opening to shift the auxiliary shutter to a shielding position, then driving the auxiliary shutter with a timing corresponding to an output of the light measuring circuit as a second operation thereof when the shutter opening of the rotary shutter is at a position passing over the exposure opening thus shifting said auxiliary shutter from the shielding position to the non-shielding position, as the rotary shutter makes one rotation, whereby an exposure time in which a light beam is irradiated onto a film

through the exposure opening as the rotary shutter rotates will become an interval of time from the moment the auxiliary shutter is shifted from the shielding position to the non-shielding position till the moment the shutter opening of the rotary shutter passes over the exposure opening, thus such an exposure control as corresponding to a light measuring output will be made.

4,456,350

ARRANGEMENT FOR THE VIEWING PROJECTION OF FRAMED SLIDES

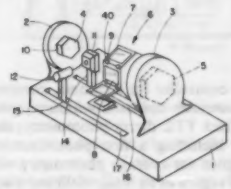
Bohdan Drwiega, "L'Eurydice", 231 Ave., Aristide Briand, F 06190 Roquebrune-Cap-Martin, France

Continuation-in-part of Ser. No. 138,703, Apr. 9, 1980, abandoned. This application Mar. 10, 1982, Ser. No. 356,626

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1979, 2914833

Int. Cl.³ G03B *23/10, 21/00*

U.S. Cl. 353—108 **1 Claim**



1. An arrangement for the viewing projection of framed slides, comprising: a plurality of rigid strips, each strip having a plurality of pockets for storing said slides adjacent to each other; means hingedly interconnecting a plurality of said rigid strips along their longitudinal sides to form a two dimensional array of slides in a hollow open prism, having a longitudinal axis, for projection of an image of said slides; means for rotating said hollow prism about its longitudinal axis, including a revolving head at each end of said hollow prism having support surfaces for the sides of said prism; said hollow prism being stationarily mounted relative to its longitudinal axis; a light source positioned interiorly of said open prism; a lens arranged ahead of said light source so as to have a slide interposed between said lens and said light source; and carriage means movably carrying said light source and said lens in the direction of the longitudinal axis of said hollow prism so as to be positionally adjustable in that direction relative to the stationarily mounted hollow prism, and rotatable mounting means for mounting said lens on said carriage means for rotation about an axis which is substantially perpendicular to the longitudinal axis of said hollow prism to allow rotation of the projection direction of the lens.

4,456,351

FOCUS DETECTING DEVICE

Akira Hiramatsu, and Masayoshi Yamamichi, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 29, 1982, Ser. No. 343,975

Claims priority, application Japan, Feb. 5, 1981, 56-16211; Feb. 5, 1981, 56-16219; Feb. 5, 1981, 56-16220; Feb. 6, 1981, 56-16415; Feb. 6, 1981, 56-16416; Feb. 10, 1981, 56-18222

Int. Cl.³ G03B *7/08*

U.S. Cl. 354—402 **20 Claims**

1. A focus detecting device for detecting a focus condition of an optical system with respect to an object, comprising:

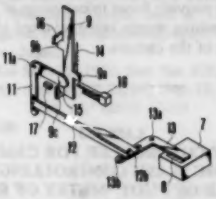
(A) sensing means for focus detection,

said sensing means having at least one sensing surface and producing an electrical indication corresponding to a sensed signal;

(B) circuit means coupled to said sensing means for detecting the focus condition of the optical system with respect to the object on the basis of the electrical indication produced from the sensing means; and

(C) means operatively arranged with respect to said sensing surface for keeping said sensing surface of the sensing means clean;

said keeping means being constructed in the form of means for dustproofing said sensing surface of the sensing means;



said dust-proofing means being arranged to be movable relative to said sensing surface of the sensing means.

2. The device according to claim 1, wherein said sensing means is sensitive to radiation and has a radiation receiving surface which forms said sensing surface; and

said dust-proofing means has a radiation transmitting property.

4,456,352

LIGHT RECEIVING APPARATUS FOR USE IN SINGLE-LENS REFLEX CAMERA

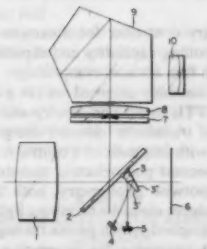
Yasuhisa Sato, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 24, 1982, Ser. No. 351,935

Claims priority, application Japan, Mar. 6, 1981, 56-32112

Int. Cl.³ G03B *7/08*

U.S. Cl. 354—429 **3 Claims**



1. A single lens reflex camera, comprising:

a picture-taking optical system for forming an image of an object on an image forming plane;

first means for directing the light transmitted through said picture-taking optical system to a view-finder optical system, said first means being movable between a first position for reflecting the light from said picture-taking optical system to said view-finder optical system and a second position for directing the light from said picture-taking optical system to the image forming plane, said first means having a semi-transmitting area formed in at least a portion thereof for passing therethrough at least a portion of the light from said picture-taking optical system; and

second means for reflecting the light transmitted through said semi-transmitting area of said first means in a direction other than the direction towards the image forming plane when said first means is in said first position, said second means having a plurality of reflecting surfaces each at a different angle of inclination for splitting the

light from said semi-transmitting area of said first means, said second means being adapted to move, upon movement of said first means to said second position, to a position whereat it does not reflect the light directed to the image forming plane.

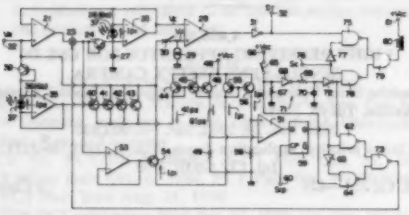
3. A single lens reflex camera according to claim 2, further comprising plural photosensitive means for receiving the light split by said second means, one of said photosensitive means being adapted to provide focus information of the camera and another photosensitive means being adapted to provide exposure information of the camera.

4,456,353

PHOTOMETRY CONTROLLER FOR CAMERA HAVING AN ELECTRONIC FLASH CONTROLLING CAPABILITY AND CAPABLE OF PHOTOMETRY OF REFLECTION FROM FILM SURFACE

Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 423,700
Claims priority, application Japan, Dec. 11, 1981, 56-200379
Int. Cl.³ G03B *7/093, 7/099, 15/05*
U.S. Cl. 354—414 **11 Claims**



1. A photometry controller for a camera having an electronic flash controlling capability and capable of photometry of reflection from film surface, comprising:

a photometric assembly disposed within a camera which is adapted for TTL direct photometry and including a first photoelectric transducer element designed for average photometry with emphasis on a central region of an image field and a second photoelectric transducer element designed for spotwise photometry, both the first and the second transducer elements receiving light from an object being photographed which passes through a taking lens;

a photocurrent integrator for integrating a photocurrent produced by one of the transducer elements;

a brightness difference decision circuit responsive to output photocurrents from said first and second transducer elements to compare the brightness of a particular region of an image field and the brightness of its marginal region against each other and to produce a brightness difference signal whenever they assume a given relative value;

a gating circuit responsive to the brightness difference signal including a delay circuit for delaying the timing when the integration of the photocurrent by the integrator is initiated by a given time interval from the initiation of exposure triggered by a shutter release of the camera;

and a comparison circuit responsive to said integrator for producing an emission terminate signal for operating an associated electronic flash whenever the integrated output voltage from the integrator reaches a preset decision voltage of the camera,

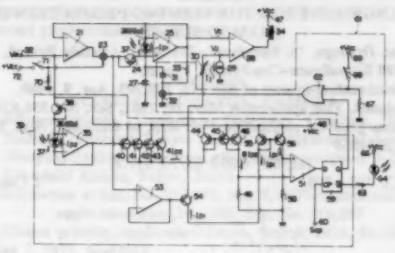
thereby permitting the proportion of the integrated flashlight from the electronic flash relative to the integrated natural light to be increased.

4,456,354

EXPOSURE CONTROLLER FOR A CAMERA

Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Sep. 27, 1982, Ser. No. 425,107
Claims priority, application Japan, Dec. 11, 1981, 56-200380
Int. Cl.³ G03B *7/93, 7/99*
U.S. Cl. 354—414 **14 Claims**



1. An exposure controller for a camera, comprising:

a photometric assembly disposed within a camera which is adapted to effect TTL direct photometry, the photometric assembly including a first photoelectric transducer element designed for average photometry with emphasis on the central region of an image field and a second photoelectric transducer element designed for spotwise photometry, both transducer elements having light receiving areas disposed for photometry of light from an object being photographed which passes through a taking lens;

a photocurrent integrator for integrating an output current from at least one of the transducer elements;

a brightness difference decision circuit responsive to photometric outputs from the transducer elements to compare the brightness of a specific area on the image field against the brightness of its marginal area and to produce a brightness difference signal whenever the difference of the aforesaid brightness values assume a given relative value;

and an exposure correction circuit responsive to the brightness difference signal for altering the time when an exposure period is determined based on the comparison of an output voltage from the photocurrent integrator and a decision voltage preset in the camera, by a given amount in a direction toward overexposure.

4,456,355

CONTROL APPARATUS FOR FILM DISC PROCESSOR

Kenneth M. Kaufmann; Robert W. Lundstrom, and Robert E. Beer, all of Minneapolis, Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Oct. 5, 1982, Ser. No. 432,859
Int. Cl.³ G03B *3/06, 3/08*
U.S. Cl. 354—299 **12 Claims**

1. A processor for processing undeveloped photographic film discs mounted on a spindle assembly, the processor comprising:

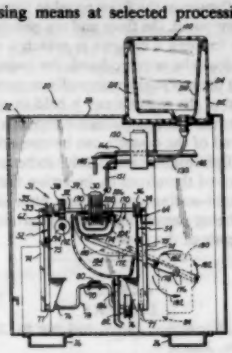
spindle sensing means for providing a spindle present signal indicative of the presence of the spindle assembly at a first end of the processor;

conveyor means for conveying the spindle assembly from the first end of the processor intermittently along a generally horizontal conveyor path to each of a plurality of processing stations, the conveyor means conveying the spindle assembly so that the spindle assembly has an axial direction which is generally horizontal and perpendicular to the conveyor path wherein the intermittent conveying of the spindle assembly by the conveyor means is cyclical with each conveyor cycle of the conveyor means having a transport portion and a processing portion;

processing tanks at selected processing stations for containing processing fluid;

tank drive means for moving the processing tanks between an upward process position and a downward dump position;

fluid dispensing means at selected processing stations for



dispensing processing fluid into the processing tank at that processing station; and

control means responsive to the spindle sensing means for controlling operation of the conveyor means, the tank drive means and the fluid dispensing means as a function of the location of the spindle assembly within the processor.

4,456,356

FOCUS ADJUSTING DEVICE OF A CAMERA

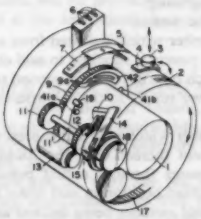
Nobuo Okabe, Tokyo, Japan, assignor to Nippon Kogaku K. K., Tokyo, Japan

Continuation of Ser. No. 299,385, Sep. 4, 1981, abandoned. This application Jul. 16, 1982, Ser. No. 399,122

Claims priority, application Japan, Sep. 11, 1980, 55-129677

Int. Cl.³ G03B *3/10*

U.S. Cl. 354—195.13 **7 Claims**



1. In a focus adjusting device of a camera having moving means for moving a phototaking lens in the direction of the optical axis thereof, a motor producing a revolution output, a manually operated ring provided on the outer periphery of a lens barrel and rotatable circumferentially of said lens barrel, mode selecting means for selecting one of a manual mode in which said phototaking lens is driven by said manually operated ring and an automatic mode in which said phototaking lens is driven by said motor, and clutch means for coupling said moving means and said manually operated ring together when the manual mode has been selected by said mode selecting means and for cutting off the coupling between said moving means and said manually operated ring when the automatic mode has been selected by said mode selecting means, the improvement comprising limit means for blocking movement of said moving means when said phototaking lens has come to an infinity in-focus position and when said phototaking lens has come to a very short distance in-focus position, said clutch means producing slip between said manually operated ring and said moving means when said manually operated ring is rotated by a great torque, thereby permitting rotation of only said manually operated ring.

4,456,357

RELEASE OPERATION DEVICE FOR CAMERA

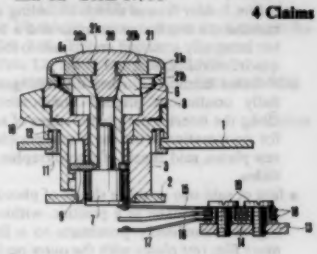
Akio Sunouchi; Masahisa Fujino, both of Tokyo, and Ryuji Suzuki, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 21, 1982, Ser. No. 420,623

Claims priority, application Japan, Oct. 13, 1981, 56-163643

Int. Cl.³ G03B *17/38*

U.S. Cl. 354—266 **4 Claims**



1. A release operation device for a camera, comprising:

a release button movable by external operation thereof, said release button having a cable release mounting screw hole;

a receiving member for receiving said release button, said receiving member having a void part which is provided for movement of the said release button and a counter-sunk part which permits actuation of said release button from outside; and

a cover member mounted on said mounting screw hole, said cover member being arranged to cover the mounting screw hole and the counter-sunk part to prevent water from entering the inside of the camera through the mounting screw hole and the counter-sunk part, the end part of said cover member being arranged to be in contact with said release button receiving member.

4,456,358

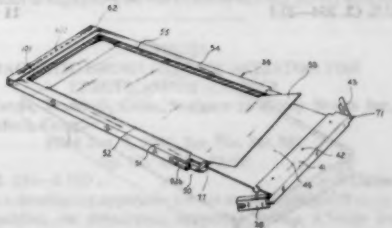
FILM HOLDER APPARATUS FOR FIELD AND STUDIO CAMERAS

Douglas I. Busch, 3828 Crosby St., Rockford, Ill. 61107

Filed Mar. 21, 1983, Ser. No. 477,637

Int. Cl.³ G03B *17/26*

U.S. Cl. 354—285 **15 Claims**



1. A film holder apparatus for the facilitated introduction and positive maintenance of one or more sheets of photographic film within field and studio cameras, of the type in

which said one or more sheets of film is maintained within said film holder apparatus at an exposure position proximate to one of one or more film rest plates, and in which one or more dark slides are removably positioned proximate to one or more sheets of said film within said holder apparatus to alternatively permit or preclude exposure of said film, as a function of the opening of a lens of said camera, said film holder apparatus comprising:

film holder frame means describing a substantially quadrilateral region in which said one or more sheets of photographic film, said one or more film rest plates and one or more dark slides of substantially equivalent shape are positioned so as to enable the exposure and in turn photographing onto said film of the image of a photographic subject;

said film holder frames means including a pair of side frame members, a top frame member and a bottom frame member integrally attached end to end to form and enclose said quadrilateral region;

said frame members further describing a series of substantially continuous aligned component retention ridges along the interior peripheral edges of said frame members for cooperation with the outer peripheral edges of said rest plates, said sheets of photographic film and said dark slides,

a first of said one or more sheets of photographic film being removably affixed in a position within said quadrilateral region immediately proximate to a first of said one or more film rest plates with the outer peripheral edge of said first sheet of film capable of being substantially and tightly crimped between the outer peripheral edges of said proximate first film rest plate along a first side of said film, and said respective component retention ridge proximately located along a second opposite side of said first sheet of film, towards positively locking said first film sheet therebetween to preclude undesirable sagging, shifting, and bowing of said film relative to both said proximate rest plate and said proximate component retention ridge; and

automatic film loading means cooperating with said film holder frame means, said component retention ridges and said first film rest plates to enable insertion and positioning of said film within said apparatus in a facililtated manner relative to said rest plates, and for crimping in a substantially gradual manner, said film's outer pepripheral edge between said proximate component retention ridge and the peripheral edges of said proximate first rest plate along said second and first film sides respectively.

4,456,359

FLAT PHOTOGRAPHIC SHEET PROCESSING CASSETTE

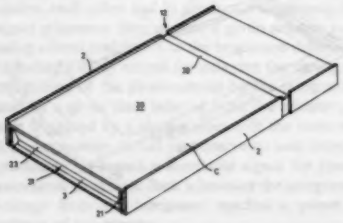
George F. A. M. Turner, Ingatestone, England, assignor to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 27, 1982, Ser. No. 436,908

Claims priority, application United Kingdom, Nov. 4, 1981, 8133192; Nov. 4, 1981, 8133193

Int. Cl.³ G03D *3/02*

U.S. Cl. 354—312 **11 Claims**



1. A photographic sheet material processing device comprising a cassette which is composed of a light opaque material and which comprises a substantially flat floor panel with upstanding side flanges along two parallel sides and a substantially flat top panel with downward projecting side flanges along two parallel sides, said downward projecting side flanges fitting within the side flanges in the floor panel to form side walls and to cover the floor panel, the floor and top panels together with their side walls forming a cassette in which a sheet of photographic material can be accomodated, the cassette being characterized in that the top panel is pivotally mounted on the floor panel at one end of the cassette and is held in contact with the floor panel by a resilient band which surrounds the cassette so that the other end of the cassette can be opened sufficiently to allow a sheet of photographic material to be inserted into the cassette or removed therefrom by inverting the cassette, there being present light-sealing means along both sides of the cassette and there being present light-sealing but liquid permeable means at both ends of the cassette.

4,456,360

CAMERA

Shuichi Tamura, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

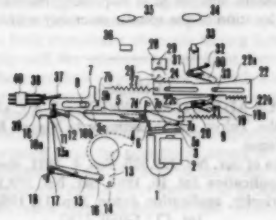
Continuation of Ser. No. 279,223, Jun. 30, 1981, abandoned.

This application Mar. 31, 1983, Ser. No. 480,363

Claims priority, application Japan, Jul. 3, 1980, 55-91104; Jul. 3, 1980, 55-91105; Jul. 3, 1980, 55-91106

Int. Cl.³ G03B *3/10, 7/08*

U.S. Cl. 354—195.1 **9 Claims**



1. A camera, comprising:

(a) electromagnetic means;

(b) a latching member which is shifted from a first state to a second state as power is supplied to said electromagnetic means and which returns from the second state to the first state as the power supply to the electromagnetic means is stopped;

(c) a control member which moves in a prescribed direction as an engagement thereof with the latching member is released and passes through a first position, a second position and a third position in said order by said movement, said control member being latched at the first position and the third position when the latching member is at the first state and is latched at the second position when the latching means is at the second state;

(d) a focus adjusting mechanism which initiates a focusing operation as the control member is shifted from the first position to the second position, and stops the focusing operation as the control member is shifted from the second position to the third position;

(e) a shutter mechanism which makes an exposure operation as the control member shifts itself further from the third position;

(f) a focus adjusting circuit which initiates a power supply to the electromagnetic means corresponding to a release operation of the camera, and controls the power supply to the electromagnetic means; and

(g) a shutter control circuit which initiates the power supply to the electromagnetic means again after the control of power supply to the electromagnetic means by said focus

adjusting means has been completed, and which controls the power supply to the electromagnetic means.

4,456,361

PROGRAM TYPE EXPOSURE CONTROLLING DEVICE

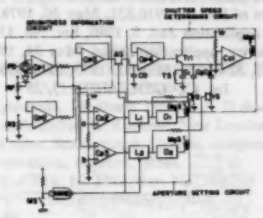
Kazuo Shiozawa, Tokyo, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 365,587, Apr. 5, 1982, which is a continuation of Ser. No. 177,810, Aug. 13, 1980, abandoned. This application Nov. 7, 1983, Ser. No. 550,052

Claims priority, application Japan, Aug. 18, 1979, 54-104533; Dec. 18, 1979, 54-163539

Int. Cl.³ G03B 7/08, 7/087, 7/097

U.S. Cl. 354—443 12 Claims



1. A program type exposure controlling device for apparatus having an aperture setting device which is adjustable in steps to any one of a plurality of preset aperture settings and having a shutter whose speed is adjustable comprising: an object brightness information circuit for receiving light from an object and for generating a first object brightness information signal related thereto; first means for receiving said first object brightness information signal and for providing a second aperture information signal for setting said aperture setting device at a selected one of said settings in accordance with said first object brightness information signal; and second means for receiving said first object brightness information signal and said second aperture information signal, for determining a shutter speed in accordance with both of said last-recited first and second signals, and for providing a third signal for operating said shutter at the determined shutter speed.

4,456,362

PORTABLE IMAGE FORMING APPARATUS

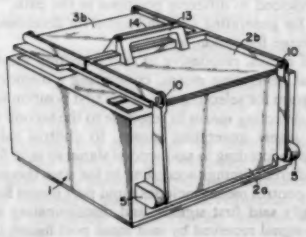
Nobuo Masaki, Tokyo; Hiroyuki Tokuda, Kawasaki; Yoshiki Furukawa, Tokyo; Mitsuru Sakurai, Musashino, and Hiroshi Nitanda, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 25, 1982, Ser. No. 342,366

Claims priority, application Japan, Feb. 5, 1981, 56-15131[U]

Int. Cl.³ G03G 15/00

U.S. Cl. 355—3 R 5 Claims



1. A portable image forming apparatus comprising:

a body portion of the apparatus;

sheet holding members projecting from said body portion for holding sheet material thereon;

supporting means for pivotally supporting said sheet-holding members on said body portion, wherein said sheet holding members are pivotally movable between a storage position and an open sheet-holding position; and

handle members provided on said sheet-holding members for enabling transportation of the body of the apparatus when said sheet-holding members are pivoted to their said storage position.

4,456,363

PAPER FEEDING ARRANGEMENT FOR COPYING APPARATUS

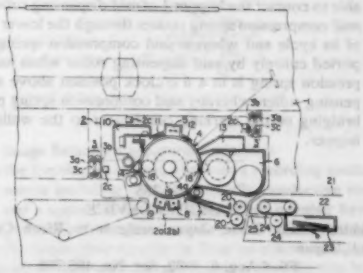
Tsugio Hirabayashi, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,449

Claims priority, application Japan, Feb. 24, 1981, 56-26632

Int. Cl.³ G03G 15/00

U.S. Cl. 355—3 R 2 Claims



1. In an electrophotographic copying apparatus of the type in which a main frame supports a copy plate and the associated optical system, a paper feeding cassette, primary paper feeding means and a conveyance guide therefor, a primary driving power source, and a subframe supported for lateral movement into and out of the lateral boundaries of the main frame and carrying a photosensitive drum and associated image forming, developing and cleaning means and a drive shaft for the same engageable with the primary driving power source when said subframe is positioned wholly within said main frame, the improvement comprising paper feeding means timed relatively to the rotation of said drum, mounted on said subframe to feed paper into operable relationship with said drum, and in which the paper feeding means on said subframe is positioned in operable relationship with said primary paper feeding means on said main frame to receive paper therefrom when said subframe is positioned wholly within said main frame and said drive shaft is engaged with the primary driving power source.

4,456,364

MAGNETIC BRUSH HOPPER AGITATOR FOR ELECTROPHOTOCOPIER

Van Hatzis, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 9, 1982, Ser. No. 386,507

Int. Cl.³ G03G 15/08

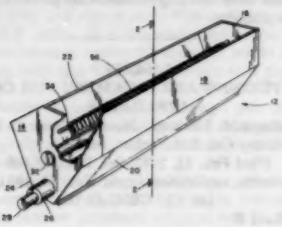
U.S. Cl. 355—3 DD 4 Claims

1. In a developing apparatus for use in an electrostatic copying machine, the developing apparatus having a sump for holding two-component developing material consisting of a marking constituent and a magnetic carrier constituent and a hopper for holding and dispensing the marking constituent to the sump, said hopper having an opening at the bottom thereof and a dispensing roller situated above said opening, an im-

proved device for agitating the marking constituent held in said hopper, comprising:

a straight section of wire rotatable through said marking constituent in said hopper, said straight section of wire being rotatable about and parallel to a longitudinal center line of said hopper; and

a compression spring surrounding and hanging on said straight section of wire, said compression spring being



able to contact the hopper ½ of said dispensing roller when said compression spring rotates through the lower portion of its cycle and wherein said compression spring is supported entirely by said dispensing roller when said compression spring is in a 6 o'clock position above said dispensing roller, whereby said compression spring prevents bridging of the marking constituent to the walls of the hopper.

4,456,365

CHARGING DEVICE

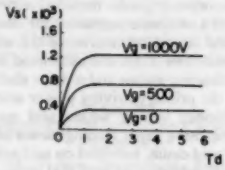
Kazuhiro Yuasa, Zama, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Aug. 6, 1982, Ser. No. 405,768

Claims priority, application Japan, Aug. 7, 1981, 56-123833

Int. Cl.³ G03G *15/02*

U.S. Cl. 355—3 CH **7 Claims**



1. A charging device for charging the surface of an image forming member uniformly prior to the formation of an electrostatic latent image thereon while said charging device and said image forming member are being moved relative to each other, said device comprising:

at least one first corona wire extending across said image forming member in the direction transverse to the direction of the relative motion between said charging device and said image forming member;

a first conductive shield surrounding said first corona wire, said shield being connected to a reference potential and defining an opening opened toward the surface of said image forming member;

a voltage source connected to said corona wire for applying a required voltage to said first corona wire to produce corona ions, said voltage source including a first voltage source for applying an A.C. voltage to said corona wire and a second voltage source for applying a D.C. voltage to said corona wire as a bias;

at least one second corona wire extending generally in parallel with said first corona wire disposed outside the space defined by said first shield;

a second conductive shield surrounding said second corona wire, said second shield being connected to said reference potential and defining a second opening opened toward the surface of said image forming member; and

a third voltage source connected to said second corona wire for applying a predetermined D.C. voltage to said second corona wire.

4,456,366

IMAGE FORMING PROCESS CONTROL

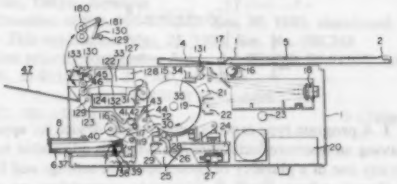
Yutaka Komiya, Tokyo; Katsumi Murakami, Kawasaki; Tsuneki Inuzuka, Machida, and Hisashi Sakamaki, Yokohama, all of, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 910,831, May 30, 1978, abandoned. This application Jun. 5, 1980, Ser. No. 156,645

Claims priority, application Japan, May 31, 1977, 52-64528; May 31, 1977, 52-64529; May 31, 1977, 52-64530

Int. Cl.³ G03G *15/00, 15/28*

U.S. Cl. 355—8 **17 Claims**



1. An image forming apparatus comprising:

a photosensitive medium;

means for forming an image on said photosensitive medium comprising a movable member reciprocating along a scanning path to scan an original image;

means provided along said scanning path and adapted for detecting arrival of said movable member at a predetermined position; and

means for stopping the movement of said movable member and reversing said movement in response to said detecting means wherein the movement of said movable member stops and reverses after eventual passing of said movable member through said detecting means thereby achieving secure stopping irrespective of an erroneous reciprocating function thereof.

5. An image forming apparatus comprising:

a photosensitive medium;

operable means for forming an image on a surface of said photosensitive medium, said operable means having reciprocable means for applying scanned image light from an original onto said photosensitive medium;

means for detecting that said reciprocable means is located at a predetermined position in the reciprocation path thereof and for generating a plurality of first signals which correspond to different positions in the path;

means for generating a second signal for determining the size of image formation; and

control means, responsive to said detecting means and said signal generating means, comprising a memory storing a program for selecting one of the first position signals from said detecting means in response to the second signal from said signal generating means, to control said operable means according to said second signal so as to form images in different timings according to the sizes thereof, wherein said control means includes input port means for receiving serially said first signals, and discriminating serially the first signal received by said input port means to stop said reciprocable means in response to said one of the first signals, and wherein said control means discriminates a leading edge and a trailing edge of each of the first signals.

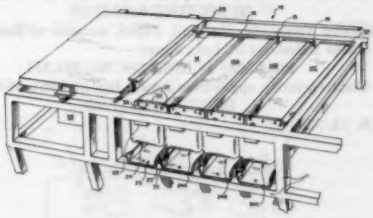
8. An image forming apparatus comprising:
operable means for forming an image on a medium;
means for accommodating the medium;
means for generating a signal for determining the size of image formation, said signal generating means including a switch actuable by said medium accommodating means;
control means, responsive to said signal generating means, including a computer storing a program for determining the size to control said operable means in accordance with said signal so as to form images in different periods of time in dependence on the sizes; wherein said computer includes input port means for receiving the signal from said switch, and for discriminating the size in accordance with the signal received by the input port means, and wherein the discrimination of the size is carried out at least prior to start of the image formation, and is repeatedly carried out.

4,456,367

TONING SYSTEM FOR ELECTROSTATIC IMAGING APPARATUS

Michael J. Szymanski, Medford; Harold J. Weber, Sherborn, both of Mass.; Manfred R. Kuehnle, New London, N.H., and Kenneth D. Fraser, Scarborough, Canada, assignors to Coulter Systems Corporation, Bedford, Mass.

Filed Feb. 16, 1982, Ser. No. 348,761
Int. Cl.³ G03G *15/10*
U.S. Cl. 355—10 38 Claims



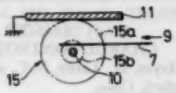
1. Apparatus for producing a toned image from a latent electrostatic image carried on the photoconductive surface of an electrophotographic member comprising:
A. platen means for mounting the electrophotographic member having the photoconductive surface such that the surface faces downward,
B. a toning module including
i. a planar development electrode mounted on the module and having an upper surface,
ii. a sump adapted to carry a supply of liquid toner therein suitable for developing said latent image,
iii. slot means extending substantially along the length of said electrode adjacent opposite parallel edges of said electrode,
iv. fluid coupling means between said sump and said slot means and including means for circulating said toner within said sump to flow through said slot means, across said upper surface of said development electrode and back to said sump whereby to establish a fluid toner layer of a generally predetermined thickness on the upper surface of said electrode,
C. means for moving the electrophotographic member mounting means and the toning module relative to one another such that the upper surface of said electrode and the photoconductive surface of the electrophotographic member when carried by said mounting means will pass one another along parallel spaced-apart horizontal planes,
D. means resiliently biasing said development electrode toward a disposition in intercepting relation with said platen means,
E. said toning module having spacing slider means adapted to intecept said platen means during said relative movement and thereby displace said development electrode against its biased disposition to dispose the upper surface thereof a predetermined distance from the photoconductive surface during passage of said upper surface and the photoconductive surface past each other, whereby directly to establish a precise toning gap between said upper surface and the photoconductive surface that is at most the thickness of said fluid toner layer and
F. means for establishing an electrical bias field across said gap.

4,456,368

IMAGE FORMATION APPARATUS HAVING HIGH FREQUENCY WAVE FIXING MEANS

Kazuo Isaka, Kawasaki; Nagao Hosono, Chofu, and Tohru Takahashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 15, 1982, Ser. No. 339,658
Claims priority, application Japan, Jan. 26, 1981, 56-9957
Int. Cl.³ G03G *15/20*
U.S. Cl. 355—3 FU 27 Claims



1. An image formation apparatus including:
means for forming an unfixed image on a recording medium;
fixing means including a first electrically conductive member and a second electrically conductive member having an oposed width smaller than the width of said first electrically conductive member to form an electric field concentration area, wherein said means is for effecting high-frequency-wave-fixing of the unfixed image on the recording medium in an electric field area formed by said first and second electrically conductive members; and
means for passing the recording medium, on which the unfixed image is formed, through said electric field concentration area in a close or slidable relationship relative to the second electrically conductive medium, wherein said high-frequency-wave-fixing means as a third electrically conductive member for increasing said electric field area.

4,456,369

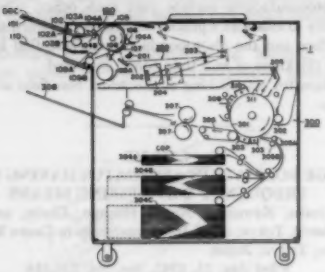
COPYING MACHINE WITH AUTOMATIC DOCUMENT FEEDER

Yukio Sato, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 12, 1981, Ser. No. 320,706
Claims priority, application Japan, Nov. 18, 1980, 55-161426; Nov. 18, 1980, 55-161427; Nov. 20, 1980, 55-162571; Nov. 20, 1980, 55-162572; Nov. 21, 1980, 55-163197; Nov. 29, 1980, 55-167378; Nov. 29, 1980, 55-167379
Int. Cl.³ G03G *15/00*
U.S. Cl. 355—14 SH 7 Claims

1. A copying machine having an automatic document feeder comprising:
movement and feed out means for moving and feeding out an original for scanning of the original, said means moving circulatively the original in one direction;
image forming means for forming an image on a recording material according to the original;
feeding means for feeding the recording material to said image forming means; and
control means for controlling the operation of said feeding means in accordance with a variable timing signal, wherein a moving velocity of the original moved by said

movement and feed out means and an image forming velocity of said image forming means are relatively variable and determine said variable signal according to a selected copy magnification.

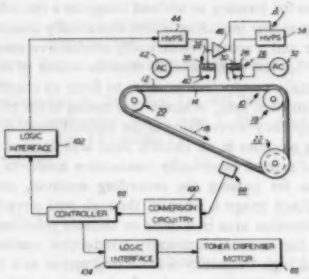


4,456,370

CHARGE CONTROL SYSTEM

Thomas A. Hayes, Jr., Leroy, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 8, 1982, Ser. No. 439,686
Int. Cl.³ G03G 15/00
U.S. Cl. 355—14 CH 12 Claims



1. An apparatus for controlling the charging of a photoconductive surface, including:

first corona generating means for charging a portion of the photoconductive surface to a substantially uniform level; and

second corona generating means for further charging the portion of the photoconductive surface charged by said first corona generating means, said second corona generating means detecting the level of charge on the portion of the photoconductive surface charged by said first corona generating means and transmitting a control signal to said first corona generating means to regulate the level that said first corona generating means charges the photoconductive surface.

4,456,371

OPTICAL PROJECTION PRINTING THRESHOLD LEVELING ARRANGEMENT

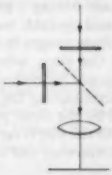
Burn J. Lin, Katonah, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 30, 1982, Ser. No. 393,921
Int. Cl.³ G03B 27/72
U.S. Cl. 355—71 4 Claims

1. An optical projection system for projecting a desired composite image at an image plane structure, comprising

one mask having the desired image transparency but which will result in undersirable intensity distribution at said image plane, and

another mask having an image transparency comprising at least two discrete areas, each of said areas having a predetermined optical density that is the same throughout the area, said optical density of said discrete areas being chosen to correct for said intensity distribution at said image plane, and



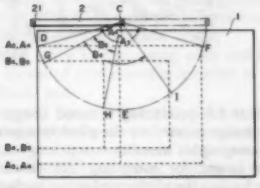
an optical system for projecting light through both of said transparencies to said structure resulting in a threshold corrected image at said image plane structure.

4,456,372

COPYING MACHINE EQUIPPED WITH A DOCUMENT DETECTING MEMBER

Kunihiro Yamauchi, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Japan

Filed May 28, 1982, Ser. No. 383,317
Claims priority, application Japan, Jun. 19, 1981, 56-89592[U]
Int. Cl.³ G03B 27/62
U.S. Cl. 355—75 7 Claims



1. In a copying machine having a transparent document table on which a document is placed, the improvement comprising a document detecting member arranged beneath said transparent document table to travel along a given scan path in relation to predetermined document placement positions, a sensor on said document detecting member of sensing the presence of a document at any of said document placement positions and generating sensor output corresponding thereto, document size discrimination means for comparing said sensor output with standard document size data stored in memory and generating a document size signal corresponding thereto prior to the copying operation, and recording paper selection means for selecting a proper size recording paper in accordance with said document size signal.

4,456,373

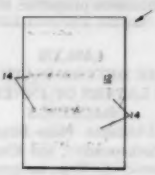
MEANS FOR DETERRING MISUSE OF COPYING MACHINES

Robert H. Best, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Apr. 26, 1982, Ser. No. 371,985
Int. Cl.³ G03B 27/52
U.S. Cl. 355—133 21 Claims

1. A device for deterring unauthorized use of xerographic copying machines of the type having a transparent platen on

which a document having a primary image to be copied is registrable, and means for reproducing said primary image thereby creating a copy of said document, said device comprising transparent means rigidly associated with said platen and



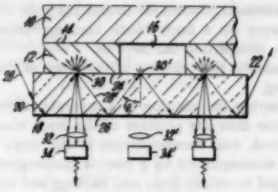
having a secondary image thereon, said transparent means for involuntarily and concurrently reproducing said primary and secondary images on each one of said document copies reproduced by said xerographic copying machine.

4,456,374

DETECTING THE PRESENCE OR ABSENCE OF A COATING ON A SUBSTRATE

Edwin Langberg, Marlton, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Dec. 11, 1981, Ser. No. 329,793
Int. Cl.³ G01N *21/88, 21/89*
U.S. Cl. 356—237 **25 Claims**



1. A method for determining the presence or absence of a coating on at least a portion of a surface of a substrate comprising:

providing a light guide having end surfaces and a longitudinal surface therebetween;

placing said substrate on said light guide with the coated surface of the substrate in optical contact with the longitudinal surface of the light guide;

directing a beam of light at at least one of said ends of said light guide; and

directly monitoring the light leaked through the interface of the light guide and the substrate.

4,456,375

OPTICAL DISC MEASUREMENT BY REFRACTION

Mark E. Gardiner, Westwood, and David W. Kuntz, Pacific Palisades, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

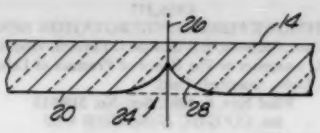
Filed Nov. 23, 1981, Ser. No. 324,341
Int. Cl.³ G01N *21/88*
U.S. Cl. 356—239 **8 Claims**

1. A method for detecting defects in an area to be inspected of the surface of a transparent plate of material, comprising the steps of:

providing a beam of collimated light having a cross-sectional size comparable to the size of said area to be inspected;

directing said beam through said plate in a direction substantially perpendicular to the plane of said surface;

providing a screen in the path of said beam which emerges from said plate, such that the beam impinges on the screen in a bright field; and



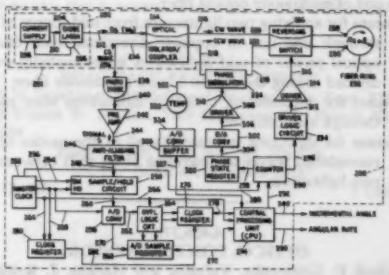
measuring the size of any circularly shaped shadows which occur in the field.

4,456,376

OPTICAL RATE SENSOR

Wilbur A. Carrington; Ronald J. Fredricks; Harry L. Gubbins; Gordon P. Eckley, all of Grand Rapids; Thomas E. Perfitt, Wyoming, all of Mich., and Jerry L. Page, Marlboro, Mass., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Apr. 6, 1981, Ser. No. 251,389
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **24 Claims**



1. An optical rate sensor for use in inertial reference systems to detect angular rotation and measure magnitude and directional sense of the rate of angular rotation, said rate sensor comprising:

a passive ring Sagnac interferometer wherein a pair of counter-propagating optical waves are transmitted in opposite directions through a ring path and emerge therefrom with a relative Sagnac phase shift indicative of said rate of angular rotation, said interferometer comprising combining means for recombining said counter-propagating waves wherein the resultant low order fringe pattern is representative of the relative phases of said counter-propagating waves;

circuit means connected to said interferometer for generating an intensity signal indicative of said resultant low order fringe pattern; and

measuring means connected to said circuit means for measuring said intensity signal and generating an output signal corresponding to said rate of angular rotation;

characterized in that

said optical rate sensor further comprises phase modulation means connected to said interferometer for externally applying to said counter-propagating waves a periodic time variant nonreciprocal phase shift so that the Sagnac phase shift for a rotation rate is a function of that time variant phase shift for which a given value of intensity signal occurs; and

said measuring means comprises offset determining means for determining an offset of said intensity signal for a given rotation rate relative to said intensity signal for a substan-

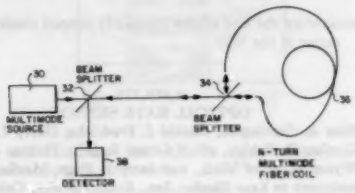
tially zero rate of said angular rotation, wherein said offset is a function of said Sagnac phase shift.

4,456,377

MULTIMODE FIBER OPTIC ROTATION SENSOR

H. John Shaw, Stanford, and George A. Pavlath, Woodside, both of Calif., assignors to The Board of Trustees of Leland Stanford Jr. Univ., Stanford, Calif.

Filed Nov. 6, 1981, Ser. No. 318,813
Int. Cl.³ G01C 19/64; G01B 9/02
U.S. Cl. 356—350 4 Claims



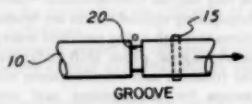
1. A fiber optic rotation sensor comprising:
a source of light for producing spatially incoherent light;
a coil of multimode optical fiber,
means for applying two lightwaves from said source of light through said coil in opposite directions, such that the optical power of said lightwaves is substantially evenly divided among the modes of said multimode fiber;
means for recombining said two lightwaves after passing through said coil, and
means for detecting substantially all of the modes of said recombined waves to determine phase shift between said two lightwaves.

4,456,378

OPTICAL POSITION SENSOR

Michael P. Goldowsky, Valhalla, and Herman J. Kolbinger, New City, both of N.Y., assignors to North American Philips Corporation, New York, N.Y.

Filed Dec. 21, 1981, Ser. No. 333,073
Int. Cl.³ G01B 11/14
U.S. Cl. 356—373 5 Claims



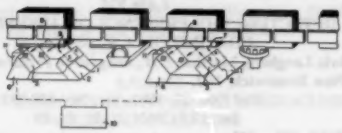
1. An optical position sensor for sensing radial position of a shaft comprising:
a light source;
means for directing a beam of light from said source toward said shaft so that a portion of said beam is blocked by said shaft and a second portion of said beam is allowed to pass by said shaft;
a light detector for detecting the portion of said beam allowed to pass by said shaft;
the portion of said beam allowed to pass by said shaft providing a measure of the position of said shaft;
means for periodically permitting during normal motion of said shaft all of said beam to pass by said shaft to said detector and thereby cause said detector to produce a maximum output signal;
means for periodically preventing during normal motion of said shaft any of said beam from reaching said detector and thereby cause said detector to produce a minimum output signal;
the maximum and minimum output signals from said detector being useful for compensating for changes in output of the light source, changes in sensitivity of the detector, and changes in transmission properties of the directing means.

4,456,379

PROCESS FOR THE DETERMINATION OF THICKNESS OF ADHESIVE LAYERS OF INNER BOOK BLOCK BACKINGS

Frank Schumann, Machern; Hans-Jürgen Richter, Leipzig; Werner Stiefel, Rückmarsdorf, and Klaus Fritzsche, Leipzig, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Apr. 6, 1981, Ser. No. 251,436
Claims priority, application German Democratic Rep., Jun. 9, 1980, 221666
Int. Cl.³ G01B 11/06
U.S. Cl. 356—381 9 Claims



1. A continuous process for determining the thickness of an adhesive layer on a book block backing immediately after application, comprising the steps of
(A) measuring the position of the edge of the book block backing,
(B) measuring the position of a separate reference plane at the same time the position of the book block backing is measured, said measurements in the steps (A) and (B) being accomplished by a pair of convergent light means arranged to reflect from said backing and reference plane respectively,
(C) applying adhesive to the book block backing,
(D) measuring the position of the surface of the adhesive,
(E) measuring the position of the same reference plane from step (B), at the same time the position of the adhesive surface is measured, said measurements in steps (D) and (E) also being accomplished by a pair of convergent light beams, arranged to reflect from said backing and reference plane respectively, and
(F) subtracting the position of the adhesive surface in step (D) from the position of the edge of the book block backing in step (A) and subtracting the difference of the position of the reference plane in step (E) from the position of the reference plane in step (B), to determine the thickness of the adhesive layer within about 0.1 mm.

4,456,380

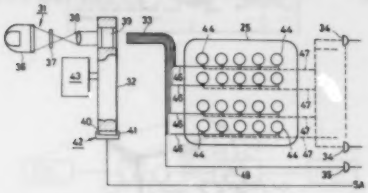
TEST SYSTEM FOR IDENTIFYING BACTERIA

Takashi Kondo, Nagaokakyo; Kiyotaka Takagi, Kyoto, and Taichiro Nishiyama, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Japan

Filed Jul. 29, 1981, Ser. No. 288,146
Claims priority, application Japan, Aug. 1, 1980, 55-106587
Int. Cl.³ G01J 3/50
U.S. Cl. 356—418 11 Claims

1. A test system for identifying bacteria comprising a transparent culture plate having a plurality of cells adapted to receive said bacteria, a light source applying light to specimen bacteria in each of the cells of the culture plate, a plurality of photoelectric elements equal to the number of cells for converting into an electric signal the light reflected from each

specimen, a rotatable support carrying a plurality of circumferentially spaced filters for producing monochromatic lights of different wavelengths from said light source disposed between said light source and said specimens, said support being continuously rotatable at a predetermined speed in a predetermined direction to permit the filters to be selected one after another, means actuated by said rotatable support for producing synchronizing signals indicative of the operative filter, and control means responsive to said synchronizing signals connected to said photoelectric elements for deriving therefrom electric signals in response to the monochromatic lights passing through a specified number of the filters, which identify said bacteria by the color of the specimen based on the electric signals.

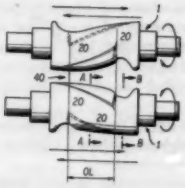


4,456,381

CLOSED TYPE MIXING/KNEADING APPARATUS

Kimio Inoue, Kobe; Tsugushi Fukui, Miki; Toshihiro Asai, Kobe; Kazuhiko Nakagawa, Kobe, and Akimasa Kuriyama, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Feb. 17, 1981, Ser. No. 234,607
Claims priority, application Japan, Feb. 16, 1981, 55-18335
Int. Cl.³ B01F *7/02*
U.S. Cl. 366—97 **6 Claims**



1. A closed type mixing and kneading apparatus having within a mixing chamber a pair of juxtaposed double-wing rotors defining an intercommunicating portion of said chamber therebetween, each one of said rotors having the respective wings thereof twisted to move a charged material inward from one end of said mixing chamber, one of the wings of each rotor having a length ratio of 0.6–0.9 relative to the total length of said rotor and a twist angle of 10°14 40°, said two wings being overlapped by 0.2–0.8 of the total length of said rotor, whereby increased mixing or shearing action is produced in said intercommunicating joint portion.

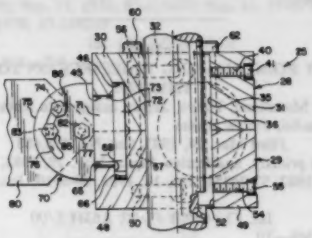
4,456,382

AGITATOR HUB

Carl P. B. Mahler, II, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Feb. 3, 1983, Ser. No. 463,373
Int. Cl.³ B01F *11/00*
U.S. Cl. 366—276 **2 Claims**

1. An agitator device for a reactor tank having a longitudinally extending shaft that is subject to being oscillated about its longitudinal axis, a hub assembly fixedly mounted on said shaft, wherein said hub assembly has an upper cylindrical portion and a lower cylindrical portion, each of said cylindrical portions having a pair of complimentary arcuate recesses defining a pair of adjacent stepped bores with a common axis, means for securing said hub assembly on said shaft, a blade holder mounted on said hub assembly, said blade holder having a pair of adjacent cylindrical portions received by said adjacent stepped bores, and said blade holder being rotatably adjustable in said adjacent stepped bores about said common axis. Lock means on said hub assembly for fixedly securing said blade holder in its rotative adjusted position on said hub assembly, and a blade securely mounted on said blade holder wherein said blade is rotatably adjustably mounted on said blade holder about an axis that is normal to said axis of said hub assembly.

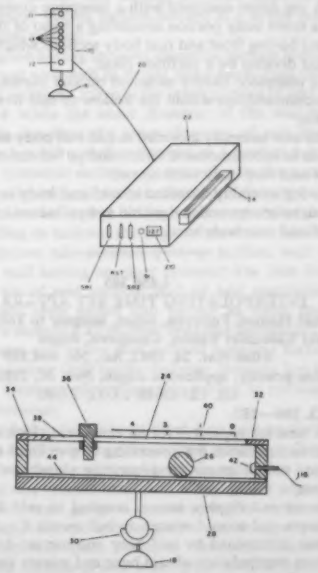


4,456,383

DRAG RACE REACTION TIMER

Frank H. Speckhart, 534 Dellwood Dr., Knoxville, Tenn. 37919, and Dennis W. Higdon, 7709 Brickyard Rd., Powell, Tenn. 37849

Filed Sep. 29, 1982, Ser. No. 426,674
Int. Cl.³ G04B *47/00*; G04F *8/00*
U.S. Cl. 368—9 **7 Claims**



1. A drag race reaction timer comprising:
a light display including a lamp of a first color, a lamp of a second color, and a signal means;

a displacement measuring means including a stop, a roller and a switch activateable by contact with said roller;

means for activating said lamp of said first color for a predetermined period of time, then activating said lamp of said second color at the end of said predetermined period; and means for activating said signal means if said switch is activated before said lamp of said second color is activated.

4,456,384

TOY ROBOT HAVING TIMEPIECE ON TORSO THEREOF

Katsushi Murakami, Tokyo, Japan, assignor to Kabushiki Kaisha Bandai, Tokyo, Japan

Filed Mar. 24, 1983, Ser. No. 478,453

Claims priority, application Japan, Mar. 29, 1982, 57-50673; Apr. 27, 1982, 57-70854; Jan. 19, 1983, 58-6910; Jan. 24, 1983, 58-9696

Int. Cl.³ G04B *47/00*; A63H *3/00*

U.S. Cl. 368—10 **5 Claims**

1. A toy robot equipped with a timepiece comprising:

(a) a robot body portion simulating a torso of the toy robot and having front and rear body sections which are hollow and divided by a partition plate;

(b) a timepiece fixedly mounted on said partition plate and accommodated within the hollow of said front body section;

(c) an arm assembly mounted in said rear body section which can be accommodated within and pulled out of the hollow of said rear body section; and

(d) a leg assembly mounted in said rear body section which can be accommodated within and pulled out of the hollow of said rear body section.

4,456,385

INTERPOLATING TIME SET APPARATUS

Motoichi Hattori, Fujisawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kanagawa, Japan

Filed Nov. 24, 1982, Ser. No. 444,335

Claims priority, application Japan, Nov. 30, 1981, 56-192265

Int. Cl.³ G04B *17/12, 27/00*

U.S. Cl. 368—187 **31 Claims**

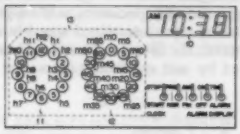
1. A time set apparatus for an electronic clock comprising:

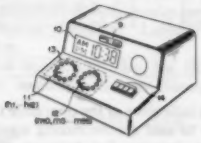
hour switch means for generating twelve kinds of hour data

minute switch means for generating plural kinds of minute data;

time set and display means, coupled to said hour switch means and to said minute switch means for displaying a time determined by said hour and minute data resulting from manipulation of said hour and minute switch means;

interpolation means, coupled to said minute switch means and to said time set and display means for interpolating a time-set interval between one kind of said minute data and another kind thereof which is adjacent to said one kind of minute data, and for generating interpolation data indicating how many times said minute data is generated, the





time displayed by said display means being modified according to said interpolation data so that an interpolated minute display is performed.

4,456,386

TIMEPIECE HAVING A DIVIDER CHAIN WITH AN ADJUSTABLE DIVISION RATE

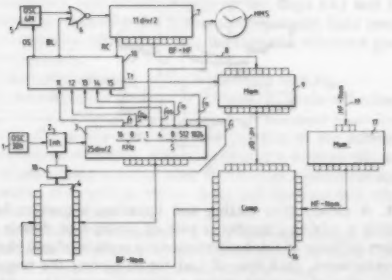
Mario Dellea, Les Geneveys-sur-Coffrane, Switzerland, assignor to Societe Suisse pour l'Industrie Horlogere Management Services S.A., Bienne, Switzerland

Filed Nov. 24, 1981, Ser. No. 324,497

Claims priority, application Switzerland, Nov. 26, 1980, 8742/80

Int. Cl.³ G04B *17/12*

U.S. Cl. 368—201 **5 Claims**



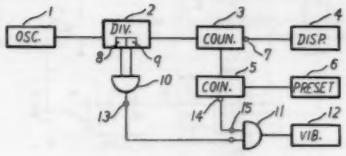
1. Timepiece including a low frequency oscillator serving as a time base and arranged to feed a first chain of frequency dividers having an adjustable division rate in order to display the time and a high frequency oscillator arranged to feed a second chain of frequency dividers, slave means coupled between said first and second frequency dividers and arranged and adapted to be operated periodically in order to obtain a binary count of the number of reference pulses counted by the second chain of frequency dividers during a predetermined time period established by the first chain of frequency dividers thereby to determine a binary value representative of the running variation of the first chain relative to the reference, first memory means coupled to said second chain of frequency dividers to receive and store said binary value and means responsve to said binary value coupled between said first memory means and said first chain of frequency dividers for correcting the division rate of said first chain during normal running of said timepiece.

4,456,387

ELECTRONIC ALARM WRIST WATCH

Kazunobu Igarashi, 18-12, Nisisugamo 3-Chome, Toshimaku, Tokyo, Japan (170)

Continuation-in-part of Ser. No. 73,129, Sep. 6, 1979, abandoned. This application Oct. 29, 1980, Ser. No. 201,799
Claims priority, application Japan, Dec. 18, 1978, 53-158191
Int. Cl.³ G04B 19/06
U.S. Cl. 368—230 9 Claims



1. A silent electronic alarm for a wrist watch, said silent alarm comprising an output member adapted to vibrate against a user's wrist, the combination comprising:

(a) generator means for generating a high frequency time standard signal;

(b) frequency divider means responsive to the time standard signal for dividing the high frequency time standard to produce low frequency signals, said frequency divider means including means for producing at least two respective signals having a first repetition rate in the range of from substantially 30 Hz to substantially 300 Hz and a second repetition rate in the range of from substantially 5 Hz to substantially 50 Hz, the first rate being greater than the second rate;

(c) counter means responsive to the output of said divider means for producing a signal representative of the present time;

(d) present time display means responsive to said present time signal produced by said counter means to display the present time;

(e) manually settable means for providing a signal representative ofonly one selected time at which it is desired to create an alarm signal comprising said vibration of said output member against said user's wrist;

(f) coincidence means, responsive to output signals from said counter means and said manual alarm time settable means, for producing an alarm enabling signal only upon coincidence of the signals representing the present time and the manually set alarm time; and

(g) vibration means, including said output member, responsive to the respective signals having the first and the second repetition rates and the alarm enabling signal, for causing said output member to vibrate against a portion of a user's wrist at the first repetition rate and at the second repetition rate intermittently when the alarm enabling signal is present;

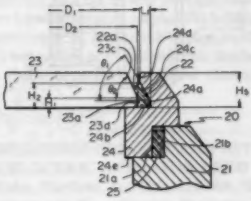
whereby the present time is constantly available in a conventional manner on said present time display means and the manually set alarm time is silently communicated to the user only upon its occurrence in real time by said vibrating means operating at said first and second repetition rates.

4,456,388

WATCH CASE STRUCTURE

Masataka Matsumoto, Tokyo, Japan, assignor to Citizen Watch Company Limited, Tokyo, Japan

Division of Ser. No. 32,849, Apr. 24, 1979, abandoned. This application May 4, 1981, Ser. No. 260,501
Claims priority, application Japan, Apr. 27, 1978, 53-50593; Aug. 2, 1978, 53-93638; Aug. 28, 1978, 53-104587; Sep. 14, 1978, 53-113391; Sep. 21, 1978, 53-115150; Sep. 21, 1978, 53-115151; Nov. 9, 1978, 53-138219
Int. Cl.³ G04B 37/08
U.S. Cl. 368—294 5 Claims



1. A structure for fixing a watchglass of a watch case, comprising:

a watchglass fixing member having an inwardly facing annular groove which has its upper portion formed with an inclined surface and has its lower portion formed with an axial surface, a flange formed at an upper portion of said inclined surface and having an inner diameter, and a watchglass seating surface formed at a lower portion of said axial surface;

a watchglass having an outer diametric surface formed with a vertical wall with its height being lower than the height of said inclined surface at the upper portion of said annular groove while the outer diameter of the watchglass is slightly less than the inner diameter of said flange, an inclined guiding surface formed at a portion below said outer diametric surface and extending in the same direction as the inclined surface of said annular groove; and

a synthetic resin gasket having an inner peripheral surface including an inclined guiding surface and a vertical inner wall below said inclined guiding surface, said vertical inner wall having an inner diameter less than the outer diameter of said vertical wall of said watchglass, said synthetic resin gasket also having an outer peripheral surface including an inclined engaging surface and a vertical outer wall below said inclined engaging surface, said vertical outer wall having its outer diameter less than the inner diameter of said annular groove to provide a gap therebetween;

said watchglass being press-fitted into said synthetic resin gasket by sliding along the inclined guiding surface of said synthetic resin gasket and being forced into a lower portion of said vertical inner wall of said gasket whereby said synthetic resin gasket is caused to expand outwardly into said gap to fill said annular groove and an upper portion of said synthetic resin gasket is compressed between the inclined surface of said watchglass and the inclined surface of said annular groove for thereby fixedly securing said watchglass in place while providing a waterproof condition.

4,456,389

HEAT FLOW CALORIMETER

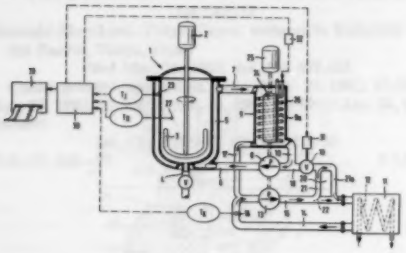
Willy Regenass; Gerhard Giger, both of Muttenz; Kaspar Kuster, Allschwil, and Heinz Achermann, Uster, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jun. 3, 1981, Ser. No. 270,185

Claims priority, application Switzerland, Jun. 10, 1980, 4465/80

Int. Cl.³ G01K *17/00*

U.S. Cl. 374—31 10 Claims



1. A heat flow calorimeter comprising

(A) a reaction vessel;

(B) a heat exchange reactor mantle about said vessel;

(C) a main circulation system for circulating a heat transfer medium therethrough, said reactor mantle being part of said system;

(D) main circulating means for circulating said medium in said main circulation system and having a pressure side and suction side;

(E) a first source of cooled circulation medium linked to said main circulation system;

(F) heating means for heating said heat transfer medium in said main circulation system;

(G) temperature sensor means for detecting the temperatures prevailing in said reaction vessel, said reactor mantle and said first source;

(H) electronic regulator means responsive to said temperature sensors and adapted for controlling the temperature of said heat transfer medium as required by said sensors, through cooling the same, by supply of cooled circulation medium from said first source, or heating said heat transfer medium in said heating means;

in accordance with a desired temperature distribution in at least one of said reaction vessel and said reactor mantle;

said electronic regulator means comprising recording means for recording the time behavior of at least one of the following data:

(i) the temperature (T_R) in the reactor and (T_J) in the reactor mantle;

(ii) the temperature difference ($T_R - T_J$);

said first source constituting a separate cooling circulation system which comprises

(a) a circulating pump having a pressure side and a suction side,

(b) a cold-generating source, and

(c) accessory duct means for completing said cooling circulation through (a) and (b); and

(I) valve means comprising a valve which links said first source to said main circulation system by connecting the pressure side of said circulating pump of said cooling circulation system with the suction side of said main circulating means with a minimum of dead volume, said valve having an entry side and an outlet side.

4,456,390

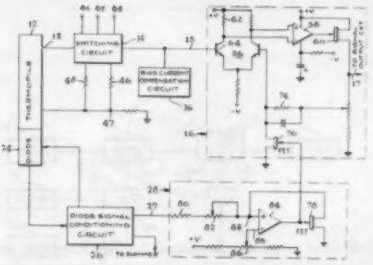
NONCONTACT TEMPERATURE MEASURING DEVICE

Kenneth G. Junkert, Woodland Hills, and Henry P. Voznick, Arcadia, both of Calif., assignors to Wahl Instruments, Inc., Culver City, Calif.

Filed Oct. 26, 1981, Ser. No. 315,343

Int. Cl.³ G01J *5/16, 5/26*

U.S. Cl. 374—128 12 Claims



1. A noncontact temperature measuring device comprising:

a thermopile radiation detector carried by a substrate for producing a first output signal indicative of the intensity of radiation incident thereon;

an amplifier having a value of gain dependent upon the ratio of the value of a first impedance to the value of a second impedance;

said second impedance comprising the source to drain impedance of a first field effect transistor;

means for coupling said radiation detector output signal to the input of said amplifier;

temperature sensing means located on said substrate proximate to said radiation detector and tightly thermally coupled thereto for producing a second output signal indicative of the ambient temperature thereat; and

compensation means, responsive to said second output signal, for varying said second impedance to vary the gain of said amplifier.

4,456,391

TILTING PAD THRUST BEARING

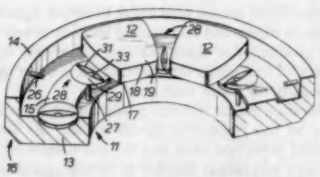
Nigel H. New, Harrow, England, assignor to AEPLC, Great Britain

Filed Sep. 29, 1982, Ser. No. 426,873

Claims priority, application United Kingdom, Sep. 30, 1981, 8129536

Int. Cl.³ F16C *17/06*

U.S. Cl. 384—307 6 Claims

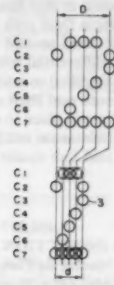


1. A tilting pad thrust bearing comprising a bearing ring, a number of similar thrust pads spaced apart and mounted circumferentially on said bearing ring, a series of lubricant distributors located in the spaces between said pads, and a series of slack-fit fixings by means of which said pads are located circumferentially and which allow said pads to pivot on said ring, and which are located outside said spaces between said pads.

4,456,392
HEAT TRANSFER PRINTER

Mineo Nozaki, Kawasaki; Osamu Asakura, Tokyo; Masasumi Nagashima, Yokosuka, and Sadao Iwakura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 9, 1981, Ser. No. 319,270
Claims priority, application Japan, Nov. 14, 1980, 55-160333
Int. Cl.³ B41J *3/02, 33/14*
U.S. Cl. 400—120 6 Claims



1. A heat transfer printer, comprising:

a thermal head for receiving a drive signal for transferring ink onto a printing paper sheet, which thermal head presses a heat transfer ink ribbon against the printing paper sheet with a predetermined force;

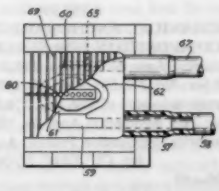
means for continuously and relatively sliding said thermal head and the printing paper sheet so as to cause a first relative speed between said thermal head and said printing paper sheet while said thermal head presses the heat transfer ink ribbon against the printing paper sheet with the predetermined force; and

feeding means for feeding the heat transfer ink ribbon by providing a force greater than the friction force caused by the press of said thermal head against the printing paper sheet, to cause a second relative speed between the heat transfer ink ribbon and the printing paper sheet and a third relative speed between the heat transfer ink ribbon and the thermal head which are pressed against each other, said second relative speed and said third relative speed being smaller than said first relative speed.

4,456,393
WIRE DOT PRINTER

Yoshifumi Gomi; Masanao Matsuzawa; Yoshito Ikeda, and Yoshihisa Morita, all of Shiojiri, Japan, assignors to Kabushiki Kaisha Suwa Seikosha & Epson Corporation, Tokyo, Japan

Filed Jun. 16, 1981, Ser. No. 274,322
Claims priority, application Japan, Jun. 17, 1980, 55-8109; Aug. 6, 1980, 55-107881; Sep. 29, 1980, 55-135621; Oct. 29, 1980, 55-151726; Dec. 22, 1980, 55-181684; Jan. 26, 1981, 56-9533[U]
Int. Cl.³ B41J *3/12, 27/20*
U.S. Cl. 400—124 67 Claims



3. A wire dot printer having a print head using a fluid ink in which printing is carried out with the ink adhering to the end faces at the end portions of printing wires for direct transfer of said adhering ink to a print medium upon impact therewith, comprising:

printing wires each having an end face;

means for selectively displacing said wires between an inking position and a printing position;

a front wire guide adapted to guide said end portions of said wires through openings in said front wire guide;

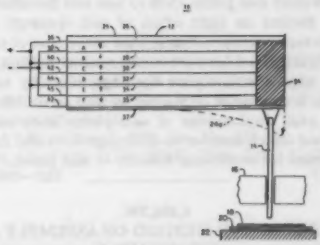
a rear wire guide positioned behind said front wire guide; and

means for providing ink to an ink path, said ink path crossing said wires between said front wire guide and said rear wire guide at positions adjacent to the end faces of said wires, the space between said front and rear wire guides defining said ink path and being dimensioned for capillary flow therein at least in the region adjacent said wires, said means for providing ink including an ink supplying port for supplying said ink to said ink path and an ink discharging port for discharging surplus ink supplied through said ink supplying port, and an ink bypass communicating with said ink supplying port and said ink discharging port, said bypass being a parallel, ink flow channel with said ink path.

4,456,394
PIEZOELECTRIC PRINTER AND ASYMMETRIC PIEZOELECTRIC ACTUATOR USED THEREIN

Henry H. Kolm, Wayland, and Eric A. Kolm, Brookline, both of Mass., assignors to Piezo Electric Products, Inc., Cambridge, Mass.

Continuation-in-part of Ser. No. 300,025, Sep. 8, 1981, Pat. No. 4,362,407. This application Mar. 31, 1982, Ser. No. 364,197
Int. Cl.³ B41J *3/12;* H01L *41/08*
U.S. Cl. 400—124 26 Claims



1. A piezoelectric printer comprising:

a frame;

a plurality of printer units mounted on said frame; each unit including:

an asymmetric piezoelectric bender including one or more piezoelectric members and having a mounting portion and an actuating portion moveable in an actuating direction; said bender being tapered in its lateral dimension, being larger at the mounting portion and smaller at the actuating portion; and a printing element driven by said actuating portion;

means for applying an actuating voltage to both of said members in the poling direction for actuating said bender to drive said printing element to the printing position; and

guide means attached to said frame for guiding said printing elements.

4,456,395
PLATEN KNOB DEVICE OF TYPEWRITER

Gian P. Barozzi, and Giancarlo Horeschi, both of Tokyo, Japan, assignors to Tokyo Juki Industrial Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 280,020, Jun. 30, 1981, abandoned. This application Nov. 7, 1983, Ser. No. 549,630
Claims priority, application Japan, Jul. 10, 1980, 55-94520
Int. Cl.³ B41J *19/96*
U.S. Cl. 400—559.1 1 Claim

1. A platen knob device of a typewriter, comprising:

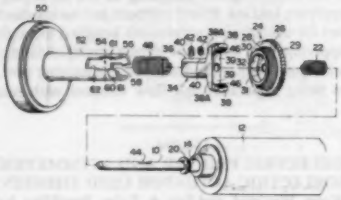
a first clutch member having two pawls having on a periph-

ery thereof engageable surfaces, said first clutch member being fixed onto a platen shaft;

a second clutch member having a surface engageable with the engageable surfaces of the first clutch member and teeth constituting a platen pitch feed mechanism, said second clutch member axially slidably mounted on the platen shaft;

a first resilient member for urging the engageable surface of the second clutch member against the engageable surfaces of the first clutch member;

a platen knob axially slidably mounted on the platen shaft and having a cylindrical portion bottomed at a base thereof, said cylindrical portion being formed with square



openings through which proximal portions of said two pawls transeversely extend, an end face of said cylindrical portion being opposite to said second clutch member;

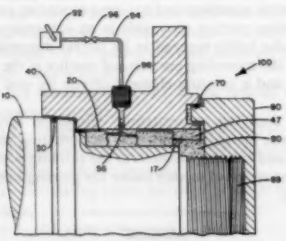
a second resilient member interposed between said platen knob and said first clutch member and for axially urging outwardly said platen knob so that said proximal portions are abutted on right edges of said openings and axial clearance corresponding to axial movement of said platen knob is defined between each proximal portion and each left edge of said square openings; whereby said platen knob is capable of displacing by said axial clearance and the axial displacement of said platen knob causes said second clutch member to disengage from said first clutch member for continuous rotation of said platen.

4,456,396

COUPLING AND METHOD OF ASSEMBLY AND DISASSEMBLY

Leonard P. Damratowski, Monroeville, Pa., assignor to Elliott Turbomachinery Company, Inc., Jeannette, Pa.

Filed Jan. 6, 1982, Ser. No. 337,233
Int. Cl.³ F16L *17/00*
U.S. Cl. 403—15 **5 Claims**



1. An assembly for mounting a hub on a shaft and the removal thereof comprising:

shaft means;

hub means adapted to be mounted on said shaft means in a force-fit;

lock nut means adapted to be threadably secured to said shaft means so as to be integral therewith and defining together with said shaft means and said hub means an annular chamber;

first seal means of a first diameter for sealing between said shaft means and said hub means at said first diameter;

second seal means of a second diameter which is larger than said first diameter for sealing between said lock nut means and said hub means at said second diameter;

third seal means of a third diameter which is smaller than said first diameter for sealing between said lock nut means and said hub means at said third diameter;

means for providing a fluid path to said annular chamber;

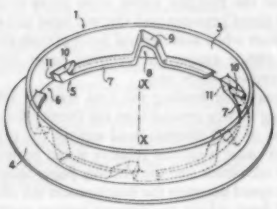
whereby if said first and second seal means are in place to establish a first differential area on said hub means and fluid pressure is supplied to said fluid path, said hub means will be pushed onto said shaft means, and if said first and third seal means are in place to establish a second differential area on said hub means and fluid pressure is supplied to said fluid path, said hub means will be pushed off of said shaft means.

4,456,397

ROAD INSPECTION MANHOLE

Jean L. Freis, Saint Nicolas du Port; Jean C. Hauer, Saulxures les Nancy, and Jacques Oger, Pont-A-Mousson, all of France, assignors to Centre de Recherches de Pont A Mousson, Pont A Mousson, France

Filed Jun. 3, 1982, Ser. No. 384,704
Claims priority, application France, Sep. 23, 1981, 81 17906
Int. Cl.³ E02D *29/14*
U.S. Cl. 404—25 **25 Claims**



1. A manhole, comprising:

a frame (1; 22) embedded into a surface covering, said frame having on its periphery three first support surfaces (9; 42; 42A) with a double slope extending downwardly in a circumferential direction and downwardly in a radial direction toward a center axis (X—X) of said frame, and, between these three surfaces, said frame having three second support surfaces (11; 43; 43);

a movable cover (2; 21) insertable into said frame, said cover having six surfaces (14, 15; 31, 32, 31A, 32) complimentary to said six surfaces of said frame which engage with said six surfaces of the frame when said cover is inserted into said frame.

4,456,398

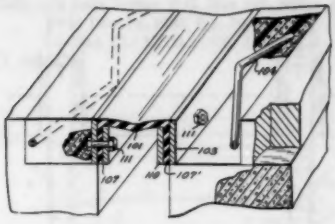
MECHANICAL ANCHORAGE IN RESINOUS COMPOSITION FOR SEALING STRIP

Marcel Ceintrey, Anse de Kerjegu, 29120 Combrit, France

Division of Ser. No. 200,581, Oct. 24, 1980, Pat. No. 4,362,430, Continuation-in-part of Ser. No. 174,457, Aug. 1, 1980, abandoned. This application Aug. 26, 1982, Ser. No. 411,629
Claims priority, application France, Aug. 20, 1979, 79 21124
Int. Cl.³ E01C *11/04*
U.S. Cl. 404—69 **5 Claims**

1. An expansion joint for a concrete roadway or the like comprising an expandable sealing element, a resin mortar comprised of coarse aggregate and a resin composition and means anchoring the expandable sealing element to the resin mortar,

said anchoring means comprising a generally flat surface and one or more rods extending from said flat surface in a direction



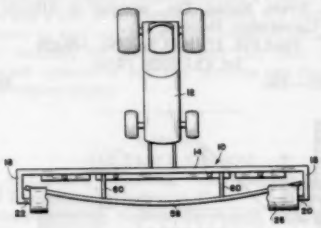
generally lengthwise along the joint, said rods being embedded in said resin mortar.

4,456,399

APPARATUS FOR LAYING PAVING FABRIC

Richard A. Conover, P.O. Box 1497, Bartsville, Okla. 74003

Filed Feb. 4, 1980, Ser. No. 118,581
Int. Cl.³ E01C *3/00, 11/16*
U.S. Cl. 404—100 **12 Claims**



1. In combination with a vehicle, apparatus for laying paving fabric along a road bed and comprising frame means, support means secured to the frame means for supporting and extending longitudinally through a roll of the paving fabric on the vehicle whereby the web of paving fabric may be pulled from the supply roll for application to the surface of the road bed, transverse tension applying means carried by the frame means and engageable with the web of paving fabric in the proximity of and slightly spaced from the outer periphery of the roll for removal of substantially all preformed wrinkles in the fabric as the fabric is pulled from the roll and substantially precluding the formation of additional wrinkles in the fabric during the laying operation, brush means carried by the frame means and oppositely disposed from the tension applying means with respect to the roll for engaging the surface of the paving fabric being placed on the surface of the road bed for assuring an efficient engagement of the paving fabric therewith, the roll support means comprising telescopically arranged rod members providing an adjustable overall length for the roll support means, and including sleeve means having the opposite ends thereof open for slidably receiving a telescopic rod member in each end, yieldable means disposed within the sleeve means and engagable with one of said rod members for constantly urging said one rod member in an axially outward direction, and stop means extending through said sleeve means and engagable with the other of said rod members for securely retaining said other rod member in a preselected position within the sleeve means.

4,456,400

PROCESS OF SAFELY DISPOSING OF WASTE MATERIALS

Günter Heide, Feldburgweg 36a, D 4154 Tönisvorst 1, and Hans Wagner, Hochbendweg 4 c, D 4150 Krefeld, both of Fed. Rep. of Germany

PCT No. PCT/EP81/00168, 371 Date Jun. 4, 1982, 102(e) Date Jun. 4, 1982, PCT Pub. No. WO82/01331, PCT Pub. Date Apr. 29, 1982
PCT Filed Oct. 21, 1981, Ser. No. 387,854
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1980, 3039660; Nov. 1, 1980, 3044436
Int. Cl.³ B09B *3/00*; E02D *3/12*
U.S. Cl. 405—128 **9 Claims**

1. A process for the safe disposal of a waste material in solid form or contained in an aqueous liquid which comprises the steps of:

homogeneously mixing said waste material and a basic power plant brown coal ash to form a homogeneous mixture having a consistency of a pulp or freely flowable slurry;

controlling the proportion of the basic brown coal ash in said mixture so that the mixture is hardenable to a virtually water-impermeable state;

depositing said mixture; and

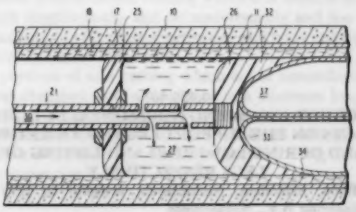
permitting the mixture to harden to a virtually water impermeable material.

4,456,401

METHOD AND APPARATUS FOR RELINING UNDERGROUND PASSAGEWAY

Augustus Williams, Clifton Park, N.Y., assignor to Finic, B.V., Rotterdam, Netherlands

Filed Nov. 9, 1981, Ser. No. 319,557
Int. Cl.³ E21D *11/00*; B29C *27/16*; B32B *31/20*
U.S. Cl. 405—150 **12 Claims**



1. A method of forming a tubular fiber reinforced plastic tube in an underground flow passage comprising:

(1) inserting a fluid impervious tubular lamina against the internal surfaces of said underground flow passage,

(2) inserting a resin absorbent fiber reinforcing tubular lamina in said impervious tubular lamina,

(3) mechanically smoothing the interior surfaces of said resin absorber fiber reinforcing tubular lamina,

(4) impregnating the mechanically smoothed resin absorbent reinforcing tubular lamina with resin in a fluid state,

(5) mechanically smoothing the resin impregnated portions of said fiber reinforcing tubular lamina,

(6) applying fluid pressure via an impervious membrane immediately after step 5,

(7) curing the resin and then

(8) removing the fluid pressure.

4,456,402

METHOD FOR INCREASING THE STABILITY OF AN ARTIFICIAL ISLAND BY MEANS OF PRE-LOADING

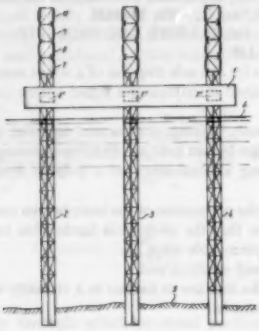
Bart Boon, Schiedam, Netherlands, assignor to Gusto Engineering B.V., Schiedam, Netherlands

Filed Sep. 8, 1980, Ser. No. 184,978

Claims priority, application Netherlands, Sep. 7, 1979, 7906710

Int. Cl.³ E02B *17/08*

U.S. Cl. 405—196 **5 Claims**



1. Method for increasing the stability of an artificial island of the type comprising a pontoon having a plurality of individual legs of open frame structure, which pontoon and legs are movable with respect to each other by means of a jacking mechanism, locking means being provided between the pontoon and each leg to secure the legs and pontoon is a selected fixed position with respect to each other, the method comprising increasing the stability by temporarily ballasting each leg of open frame structure individually, by providing the legs to be ballasted above water level with supports, by placing upon said supports detachable ballasting containers which are held in place by the open frame structure of the legs, and by filling said containers with ballast.

4,456,403

DEVICE FOR ABSORBING HORIZONTALLY DIRECTED IMPACTS ON THE SUPPORT LEGS OF AN ARTIFICIAL ISLAND DURING LOWERING AND LIFTING OF THE LEGS RESPECTIVELY

Bart Boon, Schiedam, Netherlands, assignor to RSV-Gusto Engineering B.V., Netherlands

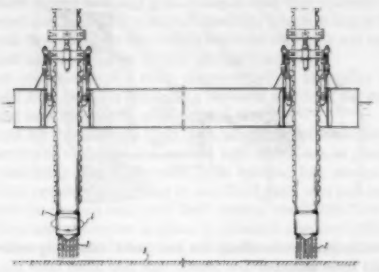
Filed Sep. 2, 1981, Ser. No. 298,801

Claims priority, application Netherlands, Sep. 4, 1980, 8005011

Int. Cl.³ E02B *17/08*; E02D *31/00*

U.S. Cl. 405—196 **2 Claims**

1. Device for absorbing horizontally directed impact loads on supporting legs of an artificial island comprising a pontoon and legs that are movable in a vertical direction with respect to the pontoon and can be locked with respect to the pontoon when the legs are lowered upon a sea bottom, said legs being able to be lifted as well and being provided with means for damping the horizontal movements of lower ends of the legs due to movements of the pontoon when the legs approach the sea bottom, characterized in that said means comprise heavy chains which each have one end thereof attached to the lowermost end of each of the legs and another end thereof free and located beneath the lowermost end of each of the legs so the chains extend downwardly from the lowermost end of each of the legs a substantial distance beyond the lowermost end of each of the legs to absorb energy by touching the sea bottom



and being dragged thereover in a horizontal direction prior to the lower end of the legs touching the sea bottom.

4,456,404

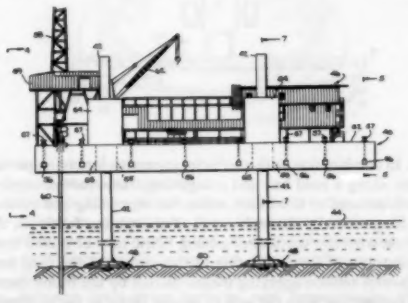
METHOD AND APPARATUS FOR POSITIONING A WORKING BARGE ABOVE A SEA SURFACE

Darrell L. Evans, Spring, Tex., assignor to Atlantic Pacific Marine Corporation, Houston, Tex.

Filed Feb. 17, 1982, Ser. No. 349,459

Int. Cl.³ E02B *17/04*

U.S. Cl. 405—196 **33 Claims**

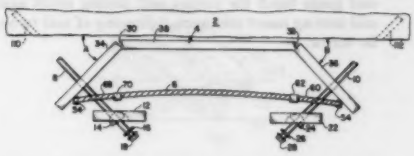


1. Apparatus for positioning a working barge in an elevated position above a sea surface, said apparatus comprising a pair of elongated buoyant wing walls having substantial freeboard, said wing walls being spaced apart and extending parallel to each other, a horizontal platform having essentially no freeboard and extending between and connected to said wing walls, a plurality of elongated support legs mounted to move up and down relative to said wing walls, jacking mechanisms mounted on said wing walls to move said legs up and down on said wing walls, said apparatus being floatable to a site of use and containing means for flooding said wing walls to change the buoyancy of said apparatus to partially submerge same and to permit same to be lowered in the water and to submerge said platform so that a working barge may be floated over the platform of said apparatus, said jacking mechanisms and said support legs being constructed and arranged to lift said wing walls and said platform from a first position at which said platform is submerged beneath the surface of the water to an elevated position at which both said platform and said wing walls are suspended above the surface of the water.

4,456,405
MINE ROOF TRUSS ASSEMBLY AND ASSOCIATED METHOD

Alex Galis, c/o Julia Tobias, P.O. Box 227, Hiller, Pa. 15444

Filed Dec. 13, 1982, Ser. No. 449,161
Int. Cl.³ E21D *11/00, 21/00*
U.S. Cl. 405—288 19 Claims

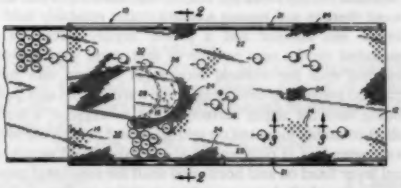


1. A mine roof truss assembly comprising a mine roof,
an elongated support member underlying said mine roof,
an elongated tension member secured in underlying relationship with respect to said support member,
roof bolt means passing through said elongated support member and into said mine roof,
said tension member operatively associated with said roof bolt means and said support member,
said roof bolt means including a pair of roof bolts passing through said elongated support member generally adjacent to the longitudinal ends of said support member,
said tension means being a flexible member, and
said elongated support member having a central body portion and a pair of end portions which are rotatable with respect to said central portion, whereby securement of said assembly by advancing said roof bolts will cause upward rotation of said end portions and tensioning of said tension means.

4,456,406
AIR TABLE SYSTEM

Ronald A. Lenhart, Lakewood, Colo., assignor to Precision Metal Fabricators, Inc., Arvada, Colo.

Continuation of Ser. No. 138,006, Apr. 7, 1980, Pat. No. 4,347,022, which is a continuation-in-part of Ser. No. 947,441, Oct. 2, 1978. This application Nov. 16, 1981, Ser. No. 321,391
The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.
Int. Cl.³ B65G *51/00*
U.S. Cl. 406—88 7 Claims

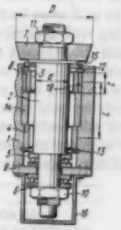


1. An air table apparatus for the transport of objects en masse which comprises:
a table having a surface of sufficient width to convey objects in multiple lines, edges and an underside with a prearranged pattern of air jet openings in the surface slanted in a downstream direction and communicating the surface and the underside;
a plenum connectable to a source of air under pressure underlying and attached to the underside of the table surface; and,
a solid cover spaced and supported above said table surface a distance slightly greater than the height of the objects, said cover including perforated top portions and imperforate top portions of sufficient extent that the air pressure between objects under the imperforate top portions is greater than between objects under the perforated top portions to cause greater separation of the objects under the imperforate top portions providing a barrier against objects tending to move into the space beneath the imperforate top portions to assist in guiding objects being transported.

4,456,407
ROTARY CUTTING TOOL

Gennady F. Shaturov, and Sergei S. Malyavko, both of Mogilev, U.S.S.R., assignors to Mogilevskoe Otdelenie Fizikotekhnicheskogo Instituta Akademii Nauk Beloruskoi SSR, Mogilev, U.S.S.R.

Filed Jan. 13, 1983, Ser. No. 457,634
Int. Cl.³ B26D *1/12*
U.S. Cl. 407—7 11 Claims

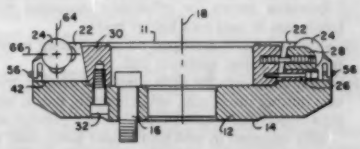


1. A rotary cutting tool comprising:
a body having an internal surface;
a shaft fitted into said body;
a cutter attached to a cantilevered end of said shaft;
journal bearings fitted into said body to support said shaft;
thrust bearings fitted into said body to support said shaft;
a bushing providing a means of fitting one of said journal bearings which is next said cutter, said bushing having end faces;
a central portion of said bushing which is of uniform stiffness both longitudinally and circumferentially and has a surface mating said internal surface of said body and being of identical shape therewith;
end portions of said bushing which are of nonuniform stiffness changing from a maximum to a minimum longitudinally towards said end faces as well as circumferentially within said end portions, the maximum and minimum values of the stiffness of said end portions being located in the same plane.

4,456,408
HIGH SPEED MILLING CUTTER

Kenneth E. Glasow, 869 Chambers St., Spencerport, N.Y. 14559

Filed Jan. 11, 1982, Ser. No. 338,714
Int. Cl.³ B26D *1/00*
U.S. Cl. 407—35 6 Claims



1. In a face mill cutter comprising a cutter body having a front face, a back face, and circumferential surfaces which define a generally cylindrical body which can be mounted on

a machine spindle for rotation about an axis which passes through the centers of said front and back faces, said cutter body also having a plurality of substantially identical radially oriented slots formed in said front face, each of said slots being adapted to receive one of a plurality of substantially identical nest plates for supporting disc-shaped cutting tools in positions in which the cutting edges of said tools project outwardly from said front face into a common cutting plane and each slot being further adapted to receive clamping means for securing said nest plates and cutting tools in said cutter body, the improvement wherein:

the diameter of each said disc-shaped tool measures between a minimum and maximum manufacturing tolerance;

each said nest plate has a main body with an opening formed therein for receiving more than one-half the circumference of a respective disc-shaped tool, said opening being shaped to provide at least three support surfaces for contacting portions of the outer circumference of said tool, two of said support surfaces being fixed relative to said main body and the other said support surface being movable relative to said main body; and

means cooperating with said movable support surface for (a) positioning said disc-shaped tool against both said fixed support surfaces and for (b) securing said tool within said nest so that, when said nest plate is thereafter secured in said cutter body by said clamping means, the projecting cutting edge of said tool lies substantially in said common cutting plane within a tolerance equal to one half or less said diametral manufacturing tolerance.

4,456,409

CUTTING TOOL

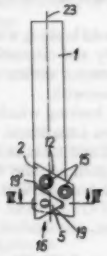
Werner Burmeister, Witten, Fed. Rep. of Germany, assignor to Fried. Krupp Gesellschaft mit beschränkter Haftung, Essen, Fed. Rep. of Germany

Filed Mar. 16, 1983, Ser. No. 475,766

Claims priority, application Fed. Rep. of Germany, Mar. 27, 1982, 3211460

Int. Cl.³ B26D *1/00*

U.S. Cl. 407—104 **10 Claims**



1. A cutting tool comprising

(a) a tool holder body having a passage and a longitudinal axis;

(b) a cutting insert seat arranged on said tool holder body adjacent said passage and having an aperture;

(c) fastening means for releasably mounting said cutting insert seat to said tool holder body;

(d) a cutting insert arranged on said cutting insert seat and having a central aperture; and

(e) clamping means for tightening said cutting insert against said cutting insert seat, said clamping means including

(1) a two-collar screw situated in said passage and threadedly engaged in said tool holder body; said two-collar screw having first and second mutually spaced collars delimiting an annular space between themselves; said two-collar screw having a longitudinal axis;

(2) a guide block situated in said passage and extending into said annular space; said guide block being in a cooperating relationship with said collars to be displaced thereby parallel to said longitudinal axis of said two-collar screw upon turning thereof relative to said tool holder body; and

(3) a tightening pin passing through said central aperture of said cutting insert and through said aperture of said cutting insert seat and being operatively connected to said guide block for pulling said cutting insert against said cutting insert seat upon tightening of said two-collar screw.

4,456,410

STABILIZATION DEVICE FOR THE STAND OF A DRILLING MACHINE

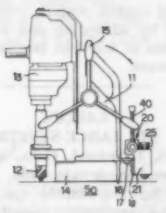
Toshio Mikiya; Mitihiro Shoji, and Tadao Tanoi, all of Tokyo, Japan, assignors to Nitto Kohki Company, Limited, Tokyo, Japan

Filed Aug. 26, 1981, Ser. No. 296,357

Claims priority, application Japan, Sep. 4, 1980, 55-125036[U]; Sep. 25, 1980, 55-135392[U]

Int. Cl.³ B23B *39/14, 45/14*

U.S. Cl. 408—76 **6 Claims**

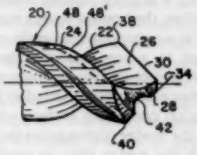


1. An electromagnet base drilling machine comprising: a drilling machine stand; an electromagnet attached to the underside of said stand for attracting an iron workpiece thereto and having a power source circuit; a rotary electric tool mounted on the front portion of said stand for vertical movement thereon and having a rotary cutter rotatably held on the lower end thereof and a power supply circuit; a punch mounted on the rear portion of said stand remote from said electric tool for vertical movement thereon and having a pointed projection extending downwardly from said punch for biting into the upper surface of the workpiece; a horizontal shaft rotatably mounted on said stand and having the rotational axis extending at right angles to the axis of said punch; a manual lever fixed on said horizontal shaft for rotational movement about the shaft from an initial position to first and second rotated positions; a switch to which said shaft is connected, said switch having contact means for, when said manual lever is in the initial position, opening the power source circuit, when said manual lever is in the first rotated position, closing said power source circuit, and when said manual lever is in the second rotated position, closing the power supply circuit for said electric tool while maintaining said electromagnet in the energized state; a stop engagable with said punch and movable for releasing said punch in response to the rotational movement of said manual lever from the first rotated position to the second rotated position; and a spring engaged with said punch for causing said punch to move downwardly to said workpiece upon the release of the punch.

4,456,411
TWIST DRILL

Burke Clement, 7823 Gleason Rd., Westview Towers, Apt. 1214, Knoxville, Tenn. 37919

Continuation-in-part of Ser. No. 291,640, Aug. 10, 1981, Pat. No. 4,400,119. This application Aug. 19, 1983, Ser. No. 524,834
Int. Cl.³ B23B 51/02
U.S. Cl. 408—223 5 Claims



1. In a twist drill having a plurality of spiral blades and flutes, each of said blades tapering and terminating in a tip portion defining a cutting edge on the leading face of each of said cutting blades, each of said cutting edges terminating in a cutting lip at the location where said cutting blades taper forming the tip portion, said tip portion defining a substantially triangular cross-sectional outline and having a central web at its apex which joins the tapered leading face and the tapered trailing face of the adjacent annularly spaced blade at the tip portion, the improvement comprising:

at least one spiral groove extending from the leading face of each cutting edge of said tip portion at a spaced location from said cutting lip to the trailing face of cutting blade tip whereby a portion of the material to be drilled initially passes through said spiral groove during the drilling operation as said drill is fed into said material such that said portion of said material passing through said groove is at least partially cut by the subsequent pass of the cutting edge of the further cutting blade tip thereby causing shavings of said material to be broken into small sizes which enhances the travel of the shavings along the length of the flute and assists in reducing binding forces normally applied to said twist drill during drilling operations, and flutes of enlarged cross-sectional area, said flutes being defined between the blade wall face terminating in the leading edge and the blade wall face terminating in the trailing edge of adjacent blades and wherein the radius of the wall defining the leading edge is less than the radius of the wall defining the trailing edge such that the enlarged cross-sectional area of the flutes allows the chips to contact the wall of the material defining the drilled hole and thereby be further broken up into smaller sections.

4,456,412
ATTACHMENT FOR A VERTICAL MILLING MACHINE

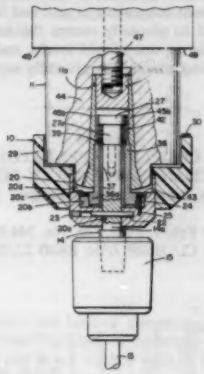
Ronald Ford; Vincent G. Ford, and Martyn J. Ford, all of San Jose, Calif., assignors to Varitork Research Mechanism, Inc., San Jose, Calif.

Filed Feb. 4, 1982, Ser. No. 345,804
Int. Cl.³ B23Q 3/12
U.S. Cl. 409—233 8 Claims

1. An attachment for a machine tool of the type that has a rotatable spindle carried in a vertically movable quill comprising a drive shaft adapted to be secured to the spindle, a tool carrier, means for supporting said tool carrier from said drive shaft including spring means for urging said carrier into driven engagement with said drive shaft, and a housing of enlarged cylindrical outer configuration secured to and surrounding said tool carrier and adapted to be manually gripped to resist rotation of said tool carrier while said tool carrier is in driven engagement with said drive shaft,

said drive shaft and said tool carrier having frusto-conical surfaces arranged to be urged into mating contact by said spring means to establish the driving engagement,

said drive shaft being a tubular member having a cylindrical bore with an annular shoulder at one end, said tool carrier having a cylindrical section extending through said bore with an enlarged cap on one end providing an annular shoulder in alignment with said annular shoulder on said

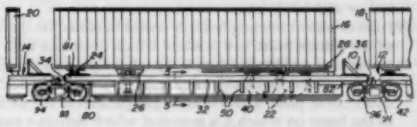


drive shaft, said spring means being disposed around the cylindrical section of said tool carrier between said shoulders and being arranged to urge said shoulders away from each other.

4,456,413
LOW LEVEL FREIGHT CAR FOR CARRYING TRAILERS

Michael J. Pavlick, Norristown, Pa., assignor to The Budd Company, Troy, Mich.

Continuation of Ser. No. 147,965, May 8, 1980, abandoned. This application Oct. 14, 1982, Ser. No. 434,294
Int. Cl.³ B61D 3/10, 15/00
U.S. Cl. 410—56 6 Claims



1. A low level freight car for carrying a trailer comparable in length to the length of said freight car and having trucks including wheels supporting each end of said car and at least one next adjacent freight car comprising:

(a) a main frame including a pair of load supporting longitudinal top side beams and end channels;

(b) side and end walls connected to said side beams and said end channels, respectively, extending downwardly therefrom and forming stress panels for transfering loads to said side beams and said end channels;

(c) a plurality of spaced, tapered braces extending substantially along the length of said freight car connected between said longitudinal top side beams and said side walls;

(d) a floor structure connected to the low portion of said side and end walls to provide a well area below said side beams and end channels to receive and support the bottom portion of a trailer therein and transfer the vertical load to said side and end wall stress panels, said floor structure of said well area being substantially in the same plane as the horizontal centerline of said truck wheels;

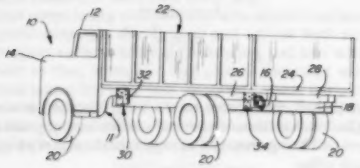
(e) said floor structure including a plurality of spaced lateral cross beams connected between the bottom portions of said downwardly extending walls having heavy grating mounted thereon for receiving the bottom portion of the trailer thereon;

(f) end frame assemblies secured to each end at said freight car adjacent said well area including coupling means secured thereto;
(g) a pair of trucks for supporting each end of said freight car; and
(h) coupling means connected to said end frame assemblies being adapted to pivotally secure the respective end of said freight car on one of said trucks, and at least one of said trucks being adapted for pivotally supporting another freight car.

4,456,414
QUICK COUPLING APPARATUS FOR INTERCHANGEABLE TRUCK BODIES

Floyd G. Williams, Naturita, Colo., assignor to Kybato, Inc., Naturita, Colo.

Filed Feb. 1, 1982, Ser. No. 344,833
Int. Cl.³ B60P *1/64*; B63B *25/20*
U.S. Cl. 410—80 **7 Claims**

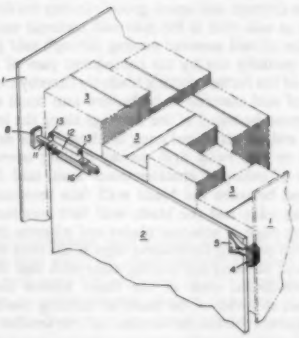


1. A quick coupling apparatus for interchanging a number of vehicle body units on a single universal vehicle chassis, the vehicle body units and vehicle chassis each having a pair of parallel, longitudinal beams with each pair of beams spaced a standard distance so that the body unit beams will overlie and be supported on the chassis beams when they are coupled, a quick coupling apparatus comprising;
(a) one or more tab means being mounted on the side surface of a body beam and arranged and positioned to extend below said body beam;
(b) one or more coupling bracket means mounted on the side of the chassis beam in a position which coincides with the position of a corresponding body tab means, said coupling bracket means includes one or more spacer blocks and an outer cover plate which is arranged parallel to the surface of the beam on which it is mounted which defines a receptical means, such spacer blocks having a thickness which is slightly greater than the thickness of said tab means whereby the tab means will easily interfit with the coupling bracket means;
(c) said tab means having a longitudinally projecting hook portion said receptical means when the body means is moved in a longitudinal coupling direction where said tab means and bracket means couple to securely retain the body unit in proper position on the vehicle chassis during use;
(d) said body tab means and said coupling bracket means have a respective contact mating surface, the contacting surface between said tab means and bracket means forming a shallow angle with respect to the contact surface between the body unit beams and chassis beams whereby as the tab means is caused to forcibly engage with the bracket means the angle of the surfaces will cause a considerable force to be applied between the body and chassis beams to rigidly hold these beams in relative position during use;
(e) in at least one of said coupling bracket means said outer cover plate is elongated and arranged parallel to the mounting beam, a bracket wedge is positioned at one end of said elongated cover plate between said cover plate and said beam so that an elongated enclosed slot is formed between the spacer blocks and the bracket wedge;
(f) a wedge locking plate arranged to securely lock the tab and bracket means in engaged position;
(g) said enclosed slot being arranged to have sufficient length after said tab means and bracket means are engaged for receiving the wedge plate adjacent to said tab means to self-lock the wedge plate by friction to retain the tab means in the coupled position during use; and
(h) said wedge plate having opposed elongated sides with one side forming a slightly tapered shallow angle with respect to the other, the bracket wedge contacting surface being arranged at a corresponding angle of between 7° to 10° with respect to a perpendicular line from a plane through the unit and chassis beam contact surface which permits the wedge plate when inserted to forcibly tighten the tab and bracket contacting surface while at the same time tightening the wedge plate against the bracket wedge to securely lock the wedge plate in position by friction caused by the forces produced in the angled contacting surfaces.

4,456,415
CARGO BRACING PANEL

Roland R. Joice-Cavanagh, Woodside, Calif., assignor to Bishop-Wisecarver Corporation, Pittsburgh, Calif.

Continuation of Ser. No. 257,380, Apr. 24, 1981, Pat. No. 4,396,325. This application Dec. 21, 1981, Ser. No. 333,043
The portion of the term of this patent subsequent to Aug. 2, 2000, has been disclaimed.
Int. Cl.³ B60P *7/14*; B61D *45/00*; B63B *25/24*
U.S. Cl. 410—129 **7 Claims**



1. Means for bracing a partition in a transportation container including:
a bearing element formed for frictional bearing against an adjacent inner wall of said container;
adjustable mounting means carrying said bearing element and formed for mounting of said bearing element to said partition, said mounting means including:
a guide member of substantially "U"-shaped cross-section;
a movable slide member carrying said bearing element and being formed of "U"-shaped cross-section;
a series of rack teeth provided in the free edges of said slide member;
a handle pivoted on said guide member;
pinion means formed on said handle and engaging said teeth;
said pinion means formed for selective disengagement from said teeth;
a stop formed to limit the rotation of said handle at about a point where said pinion means becomes disengaged from said teeth enabling said slide member to move independently of said pinion means and said handle;
a latch projection mounted to one of said handle and said guide member;

a latch means slidably mounted to a remainder of said handle and said guide member;

spaced prongs on said latch means;

said latch projection passing through the space between said prongs into and out of locked attitude; and

said latch means being slidable into latching position.

3. An extensible foot assembly for mounting to a cargo support member to enable use of the member for shoring of cargo in a transportation container, said foot assembly including a body portion formed for mounting to said support member, an elongated extensible element movably mounted to said body portion and having a bearing portion formed to engage and bear against a wall of said container, and adjustment means formed for advancement of said extensible element relative to said body portion and formed for securement of said extensible element in an advanced position to apply a bearing force to said wall, wherein the improvement in said foot assembly is comprised of:

said adjustment means including spring biasing means formed and mounted to apply a biasing force between said body portion and said extensible element in a direction urging said extensible element toward said advanced position; and

said adjustment means further including advancement means formed for selective coupling to said extensible element at a position along the length of said extensible element automatically determined by said spring biasing means, said advancement means being further formed to replace said biasing force with an increased bearing force created by positive advancement of said extensible element a predetermined distance toward said advanced position and positive securement of said extensible element in said advanced position, and said advancement means being formed for uncoupling from said extensible element to free said extensible element for displacement independently of said advancement means as urged by said spring biasing means.

7. A cargo supporting device for use in shoring cargo in a transportation container including a cargo support member, and pair of foot assemblies mounted to opposite sides of said cargo support member, said foot assemblies being formed to engage and bear upon opposite walls of said container, at least one of said foot assemblies being formed with an extensible element and adjustment means formed for advancement of said extensible element against one of said walls and securement of said extensible element in an advanced position, wherein the improvement in said cargo support assembly is comprised of:

said cargo support member is formed as a partition-like member;

said one of said foot assemblies includes biasing means coupled to said extensible element for resilient displacement of said extensible element and automatic application of a bearing force against said walls during placement of said partition-like member, and said one of said foot assemblies further includes said adjustment means; and

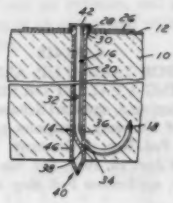
said adjustment means being formed for coupling to said extensible element at a position on said extensible element determined by displacement of said extensible element by said biasing means, said adjustment means being formed to positively displace said extensible element toward said walls a predetermined distance upon coupling to said extensible element and advancement of said extensible element to said advanced position to replace said bearing force generated by said biasing means with a bearing force having an increased magnitude generated by said advancement means, and said advancement means being further formed for retraction of said extensible element and for uncoupling from said extensible element to free said extensible element for displacement by said biasing means.

4,456,416

ANCHOR NAIL FASTENER HAVING CHISEL POINT

Seymour N. Schlein, 19924 Edmundton, St. Clair Shores, Mich. 48080

Filed May 1, 1981, Ser. No. 259,419
Int. Cl.³ F16B *15/04*
U.S. Cl. 411—358 3 Claims



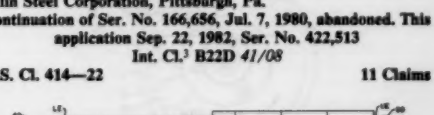
1. In an anchor nail fastener comprising, in combination, an elongated tubular member of resistingly deformable metal having upper and lower anchor ends to be driven lower end first into a workpiece, means adjacent the upper end of the member for limiting penetration of the member relative to the workpiece, the wall of said tubular member provided with a side opening aperture spaced upwardly from the lower end with a portion of the wall extending inwardly and upwardly from the lower edge of the aperture across the interior of the tubular member to the opposite interior wall face thereof to provide an upwardly facing surface for deflecting the point of a nail driven downwardly through the tubular member laterally outward through said aperture, the improvement which comprises said tube being formed of hardened carbon steel and having a hollow chisel point characterized by opposite halves of the tip of said lower end that extend in a downwardly diminishing spaced relation to form a knife edge at said chisel point along the bottom edges of said opposite side halves, said opposite side halves substantially symmetrically mating along said knife edge, said side opening aperture being open to the side of one of said opposite side halves, said knife edge having a thickness less than twice that of the wall of said chisel point, and the angle of the opposite halves of the tip acting as a wedge as the tube is driven lower-end-first into a workpiece.

4,456,417

METHOD AND APPARATUS FOR ALIGNING, SUPPORTING, AND TRANSPORTING HOLLOW CYLINDERS

Charles C. Gerding, Pittsburgh, Pa., assignor to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 166,656, Jul. 7, 1980, abandoned. This application Sep. 22, 1982, Ser. No. 422,513
Int. Cl.³ B22D *41/08*
U.S. Cl. 414—22 11 Claims



1. A method of loading hollow cylinders on a mandrel which comprises the steps of:

(1) threading a cylinder over a cantilevered end portion of said mandrel which is in a first recumbent position;

(2) shifting said mandrel with said cylinder thereon to a second recumbent position;

(3) advancing said cylinder along said mandrel to a portion thereof away from that portion which was cantilevered when said mandrel was in said first recumbent position;

(4) returning said mandrel to said first recumbent position for readiness to receive an additional cylinder; and

(5) repeating steps (1) through (4) until the desired number of cylinders are loaded on said mandrel.

4,456,418

DEVICE FOR TAKING UP, ALIGNING AND TRANSFERRING A PALLET OR SIMILAR ARTICLE

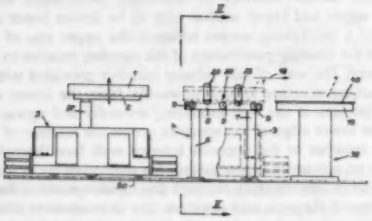
Walter Harter, Hayingen, and Karl Schumacher, Tübingen, both of Fed. Rep. of Germany, assignors to Ernst Wagner KG-Fördertechnik, Fed. Rep. of Germany

Filed Apr. 16, 1982, Ser. No. 369,104

Claims priority, application Fed. Rep. of Germany, Apr. 18, 1981, 3115775

Int. Cl.³ B65G *47/24*

U.S. Cl. 414—351 **14 Claims**



1. A device for aligning a pallet or similar article both horizontally and vertically to facilitate the transfer of the article onto a support of predetermined height and lateral position, comprises first and second vertical alignment means mounted on each side of said article for horizontal movement toward and away the respective sides of the article, and first and second horizontal alignment members which extend obliquely and are mounted on each side of the article for movement toward and away from the respective sides of the article in an oblique plane extending at an angle to the axis of said first and second vertical alignment members, the surfaces of said vertical alignment members and said horizontal alignment members engaging and supporting said pallet at a selected intersecting vertical and horizontal point.

4,456,419

CONVEYOR UNLOADING APPARATUS

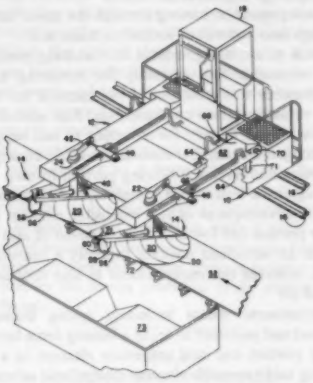
Lowell R. Counts, 1634 Echo Dr., Kingsport, Tenn. 37665, and L. Victor McFall, P.O. Box 769, Clintwood, Va. 24228

Filed Dec. 18, 1981, Ser. No. 332,244

Int. Cl.³ B65G *67/08, 47/76*

U.S. Cl. 414—398 **8 Claims**

1. Apparatus for unloading substantially free-flowing lumps of material such as coal and the like from conveying means onto railroad cars positioned below said conveying means, said apparatus comprising gantry means adapted to move lengthwise of said cars and said conveying means, arm means mounted on and extending from said gantry means, shaft means pivotally mounted on said arm means, sweep means pivotally mounted on said shaft means and overlying said conveying means, and control means for regulating the pivoting and position of said sweep means with respect to the arm means,



shaft means and conveying means for directing said material into said cars in a progressive manner lengthwise thereof.

4,456,420

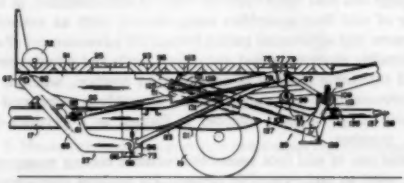
CAR CARRIER HAVING A SLIDING AND TILTING PLATFORM

Robert H. Newhard, 1230 16th St., North, St. Petersburg, Fla. 33705

Filed Sep. 24, 1981, Ser. No. 305,088

Int. Cl.³ B60P *1/16, 1/78, 3/07*

U.S. Cl. 414—478 **12 Claims**



1. In a car carrier service vehicle having a standard frame, a car carrying mechanism comprising:

a displaceable platform adapted to be disposed at a transport position, a load position, and a plurality of positions intermediate therefrom;

means coupled to the front of the displaceable platform and to the service vehicle frame for pivoting and sliding the displaceable platform; and

a support foot pivotally coupled to the service vehicle frame and removably engageable to the displaceable platform for supporting a major portion of any load on the displaceable platform when the displaceable platform is in a predetermined intermediate interval between the transport position and the load position wherein said support foot engages the means for pivoting and sliding as the displaceable platform approaches and is disposed at the load position and disengages said means for pivoting and sliding when the platform approaches the transport position.

4,456,421

LIFTING APPARATUS

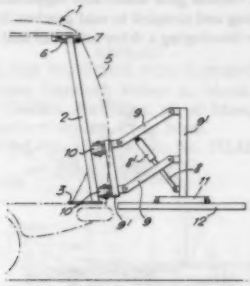
Robert Robson, 5 Badminton Close, Bragbury End, Stevenage, Hertfordshire, England

Filed Sep. 25, 1981, Ser. No. 305,896

Claims priority, application United Kingdom, Sep. 25, 1980, 8031010

Int. Cl.³ B60P 1/44

U.S. Cl. 414—546 7 Claims



1. In combination, at least one substantially upright wall defining an opening therein, for providing access through said wall, and lifting apparatus including a parallelogram-type raising and lowering portion that is extensible and collapsible in a first generally vertical plane and that comprises parallelogram linkage one side of which is secured against vertical movement and an opposite side of which moves bodily vertically, and a generally planar, load support portion connected thereto, said raising and lowering portion being pivotable about a generally vertical axis between a position on one side of said opening, wherein said load support portion lies in a second generally vertical plane generally parallel to said first plane in an inoperative storage position, and a position on the other side of said opening, wherein said load support portion lies in a third generally vertical plane substantially normal to that of said opening and generally parallel to said first plane in an intermediate inoperative position,

said load support portion being pivotable about a generally horizontal axis with respect to said raising and lowering portion between said intermediate position and an operative position, wherein it lies in a generally horizontal plane substantially normal to that of said opening and on said other side thereof,

said raising and lowering portion being actuable to move said load support portion, in its operative position, between raised and lowered positions with respect to said opening, and

the connection between said load support portion and said raising and lowering portion being horizontal pivot means having an axis parallel to said first plane and integral with said opposite side of said parallelogram linkage such that said load support portion is immovable about a vertical axis with respect to said raising and lowering portion.

4,456,422

APPARATUS FOR HANDLING OVAL ARTICLES

Kenneth Swayze, Manchester, N.H., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Oct. 1, 1982, Ser. No. 432,235

Int. Cl.³ B41F 17/22

U.S. Cl. 414—744 A 14 Claims

1. Apparatus for handling an oval article, comprising:

a rotatable support;

a carriage slidingly mounted to said support to travel along a perpendicular to its axis of rotation;

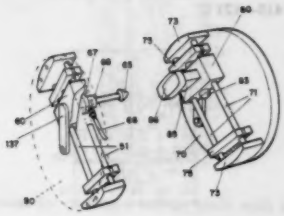
means fixed to said carriage for engaging a portion of the article;

means for limiting the travel of said carriage between first and second positions; and

pneumatic control means, comprising

an air cylinder;

a spindle axially fixed to the support, said spindle including a first conduit communicating at an output end wih a first end of said air cylinder, and a second conduit communicating at an output end with a second end of said air cylinder;



a valve block for pressurizing the first conduit during a first angular segment of rotation and for pressurizing the second conduit during a second angular segment of rotation, thereby pressurizing the corresponding end of said air cylinder during each respective angular segment of rotation; and

mechanical linkage from said air cylinder to said carriage for biasing the carriage towards its first position during pressurization of the first end of the air cylinder, and for biasing the carriage towards its second position during pressurization of the second end of the air cylinder.

4,456,423

SIDE CHANNEL BLOWER

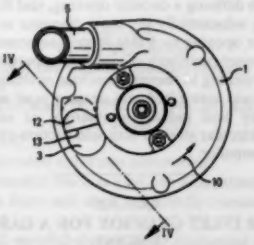
Bernd Mittmann, Munich, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Gauting, Fed. Rep. of Germany

Filed Sep. 24, 1982, Ser. No. 423,431

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1981, 3144787

Int. Cl.³ F04D 29/66

U.S. Cl. 415—53 R 4 Claims



1. A side channel blower, especially of the type for use as a combustion air blower in vehicle heaters, comprising a blower housing forming at least one side channel, an intake opening and an exhaust opening terminating in said side channel, and a blower wheel disposed in the immediate vicinity of the side channel and provided with a plurality of blades defining individual blade chambers, wherein at least the upstream edge of the intake opening, in the rotational direction of the blower wheel, is formed of a material that elastically deforms in a manner so as to gradually reduce the pressure in each blade

chamber by deflection of said edge as each chamber moves toward said intake opening.

4,456,424

UNDERWATER SAND PUMP

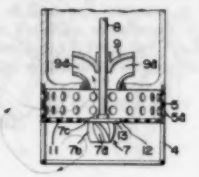
Toshinobu Araoka, Kitakyushu, Japan, assignor to Toyo Denki Kogyosho Co., Ltd., Fukuoka, Japan

Filed Feb. 25, 1982, Ser. No. 352,619

Claims priority, application Japan, Mar. 5, 1981, 56-31222[U]; Mar. 5, 1981, 56-31223[U]; Mar. 5, 1981, 56-31224[U]; Mar. 5, 1981, 56-31225[U]

Int. Cl.³ F04D *29/70*

U.S. Cl. 415—121 G **7 Claims**



1. An underwater sand pump adapted to be vertically disposed on a water bed and operable to evacuate sand and the like from said water bed, comprising a pump casing, an underwater motor mounted in said pump casing, said motor having an output shaft, said output shaft having its axis generally vertically disposed during operation of said pump, said output shaft having a lower longitudinal end portion, an agitator fixedly mounted on said end portion, said agitator comprising a truncated cone and a plurality of vanes radially mounted on the circumferential wall of said truncated cone, an impeller fixedly mounted on said output shaft, said impeller having a suction inlet generally axially aligned with the axis of said output shaft, an end plate disposed in a plane perpendicular to the axis of said output shaft and located between said suction inlet and said agitator, a cylindrical strainer on said pump casing and having its axis coincident with the axis of said output shaft, said cylindrical strainer being disposed between said end plate and said suction inlet to thereby define a cylindrical suction chamber between said suction inlet and said end plate, said suction inlet opening up into said cylindrical suction chamber, and flow separating means for separating agitation flow created by the operation of said agitator from said suction chamber, said flow separating means being integrally formed on an upper end of said truncated cone, said end plate having means thereon defining a circular opening, said flow separating means having substantially the same diameter as the diameter of said circular opening such that there is substantially no space between the outer periphery of said flow separating means and said circular opening to thereby preclude cavitation, said agitator agitating said water bed and causing sand and the like to pass upwardly and radially outwardly of said end plate through said circular strainer into said suction chamber to said inlet of said impeller.

4,456,425

MODULAR INLET GEARBOX FOR A GAS TURBINE ENGINE

William V. McCarty, and Donald J. Thiemann, both of Cincinnati, Ohio, assignors to General Electric Company, Cincinnati, Ohio

Filed Nov. 20, 1980, Ser. No. 208,893

Int. Cl.³ F01D *15/12*; F16D *1/10*

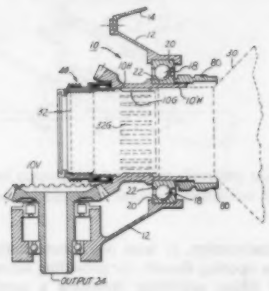
U.S. Cl. 415—122 R **6 Claims**

1. A modular inlet gearbox for use in a gas turbine engine having a fan section with an associated fan frame and a compressor section with the inlet gearbox disposed between the fan section and the forward end of the compressor section, wherein said modular inlet gearbox comprises the following elements removable simultaneously from the gas turbine engine as a unit:

(a) a gearbox housing removably coupled to a portion of the fan frame;

(b) gearbox horizontal gear means supported by said gearbox housing, said gearbox horizontal gear means having internal splines for removably mating with an externally splined stub shaft which shaft is situated at the forward end of the compressor section;

(c) gearbox vertical gear means also supported by said gearbox housing and coupled to said gearbox horizontal gear means for developing a drive output of said inlet gearbox;



(d) main shaft bearing means including an outer race fixedly disposed in said housing and an inner race mounted around and removably attached to a rearward extension of said gearbox horizontal gear means, said main shaft bearing means providing the sole rotational bearing support for said inlet gearbox horizontal gear means and the forward stub shaft end of the compressor section; and

(e) multiple locknut means for removably mating said gearbox horizontal gear means to the forward most end of said stub shaft.

4,456,426

FASTENING DEVICE FOR A TURBINE HOUSING

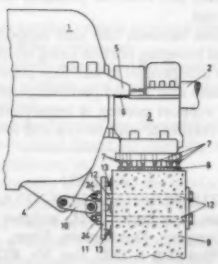
Hans Bellati, Gordola, Switzerland, assignor to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jan. 12, 1982, Ser. No. 338,877

Claims priority, application Switzerland, Jan. 14, 1981, 212/81

Int. Cl.³ B63B *25/14*

U.S. Cl. 415—219 R **3 Claims**



1. An arrangement for fastening a turbine housing to a foundation crossbeam and to a bearing housing, comprising at least one supporting rib on the turbine housing, said rib being connected in an axial direction of the turbine housing to the foundation crossbeam via a sway brace which is pivotably mounted

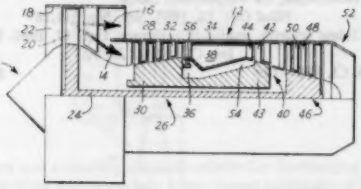
to both the rib and a retaining device on the crossbeam, an axis of the pivotal mounting of at least one end of the sway brace being adjustable in the axial direction of the turbine housing, and a mounting lug of the turbine housing being axially slidably mounted on a supporting face of the bearing housing.

4,456,427

COOLING AIR INJECTOR FOR TURBINE BLADES

Dennis C. Evans, Topsfield; Robert A. Nicoll, Beverly, and Robert E. Gladden, Burlington, all of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Jun. 11, 1981, Ser. No. 272,623
Int. Cl.³ F01D 5/18
U.S. Cl. 416—95 15 Claims



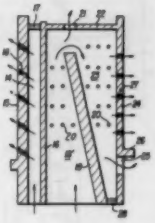
1. A gas turbine engine comprising:
a source of pressurized air;
a combustion chamber wherein fuel is burned with said pressurized air to produce a rapid flow of hot gas;
a plenum surrounding said combustion chamber effective for receiving said pressurized air;
a turbine driven by said hot gas to actuate said source of pressurized air;
said turbine including a rotatable disk having at least one row of turbine blades thereon;
said rotatable disk and turbine blades being spaced from adjacent stationary portions of said engine by a gap;
each of said turbine blades having a channel therein for the flow of cooling air, said channel being disposed at an angle relative to a longitudinal axis of said engine;
a circular row of spaced apart slots in said disk facing said gap connected to said channels in said turbine blades;
a plurality of spaced apart nozzles in a circle on said stationary portions facing said slots;
an annular stationary intermediate chamber disposed between said plenum and said nozzles;
a plurality of passages disposed in walls defining said intermediate chamber for communicating said pressurized air from said plenum to said intermediate chamber;
said nozzles being in flow communication with said intermediate chamber for receiving pressurized air therefrom and each being effective to project a stream of air at a predetermined angle from said nozzles and across said gap toward said slots in said disk; and
said passages and said intermediate chamber being sized relative to said nozzles for adding resistance to flow of said pressurized air flowable therebetween for reducing velocity and controlling flow rate thereof, so that angular misalignment represented by the difference between said predetermined angle and said angle of said channel is substantially zero in magnitude for obtaining a pressure enhancement in said slots with respect to said gap of a magnitude greater than 1.0.

4,456,428

APPARATUS FOR COOLING TURBINE BLADES

Michel L. Cuvillier, Chatellerault, France, assignor to S.N.E.C.-M.A., Paris, France

Continuation of Ser. No. 201,374, Oct. 27, 1980, abandoned.
This application Apr. 14, 1983, Ser. No. 483,443
Claims priority, application France, Oct. 26, 1979, 79 26665
Int. Cl.³ F01D 5/18
U.S. Cl. 416—97 R 8 Claims



1. An apparatus for cooling a turbine blade with air, comprising:
an envelope;
partition means positioned within said envelope in a median, radial plane portion thereof so as to form at least a first and second cavity separated by said partition means;
a plurality of link members positioned in each of said first and second cavities for thermal exchange, said blade further comprising a platform portion and trailing and leading edges with fluid discharge opening means located in said leading edge and said trailing edge and fluid discharge opening means formed in said blade under said platform portion of the blade exclusively on the trailing edge side for discharging most of the air which has been cooled into an area of selected counter-pressure; and
a cap located at one end portion of said blade wherein said partition means further comprises at least one partition extending obliquely in the median radial plane of the blade and wherein an end portion of said oblique partition and said cap form first passage means therebetween so as to allow for the air to flow from said first cavity to said second cavity.

4,456,429

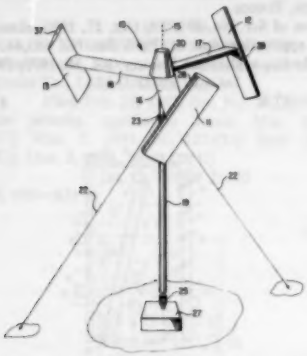
WIND TURBINE

Robert E. Kelland, 104 Watson Crescent, St. John's Newfoundland, Canada

Filed Mar. 15, 1982, Ser. No. 357,939
Int. Cl.³ F03D 7/06
U.S. Cl. 416—117 17 Claims

1. A fluid operated apparatus comprising:
a vertical rotatable shaft, at least one arm extending radially outwardly from said shaft and fixedly connected thereto at one end;
an elongated, aerofoil-shaped blade connected to the other end of said one arm so that said blade can pivot about a non-horizontal axis, said blade having a blade chord line at the point where the blade connects to the arm that in the normal operating position of the blade is normal to a longitudinal axis of said one arm, wherein the leading edge of said blade is disposed at a fixed acute angle relative to the vertical at all rotational speeds about the axis of such shaft, which angle is located in a plane generally tangential to the path of rotation of said blade; and
means for biasing said blade towards said normal operating

position, said biasing means being overcome by centrifugal forces acting on said blade when the rotational speed



of said blade reaches a predetermined limit resulting in said blade pivoting to a drag position.

4,456,430

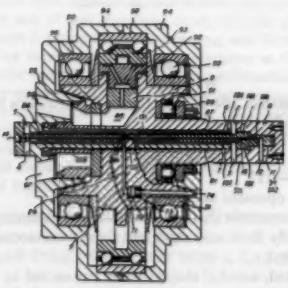
VEHICLE EMPLOYING A FLUID MOTOR WITH ARRANGEMENTS

Kazi Eickmann, 2420 Isshiki, Hayama-machi, Kanagawa-ken, Japan

Continuation-in-part of Ser. No. 954,555, Oct. 25, 1978, and a continuation-in-part of Ser. No. 110,157, Jan. 7, 1980, which is a continuation-in-part of Ser. No. 895,687, Apr. 12, 1978, abandoned, which is a continuation-in-part of Ser. No. 760,006, Jan. 17, 1977, Pat. No. 4,136,854, which is a continuation-in-part of Ser. No. 104,676, Mar. 8, 1971, Pat. No. 3,823,898, said Ser. No. 954,555, is a continuation-in-part of Ser. No. 800,756, May 26, 1977, abandoned, which is a continuation-in-part of Ser. No. 465,413, Apr. 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 610,872, Sep. 8, 1975, and Ser. No. 610,871, Sep. 8, 1975, each is a division of Ser. No. 416,237, Nov. 15, 1973, abandoned, which is a division of Ser. No. 131,782, Apr. 6, 1971, Pat. No. 3,790,105. This application Mar. 13, 1981, Ser. No. 243,324

Int. Cl.³ F01D *7/00*

U.S. Cl. 416—170 R **14 Claims**



1. A vehicle including a power plant to operate a fluid flow creating arrangement for the supply of at least one flow of pressurized driving fluid to a hydrostatic fluid motor, and in said fluid motor a housing, a revolvably mounted rotor which contains working chambers for the reception of said pressurized driving fluid, displacement means for the transfer of force of fluid to a portion of the rotor; a control body associated to the rotor and to the housing to control the flow of said driving fluid from an inlet on said housing to said working chambers of said rotor and from said working chambers of said rotor to an outlet on said housing and said vehicle including a revolvable shaft to be driven with said rotor;

wherein said rotor includes at least one interior space in addition to said working chambers;

wherein said motor contains in addition to said rotor, said shaft and said control body for the control of said driving fluid at least one independently operable member which is at least partially operable independently of subjection to pressure in said driving fluid which flows through said working chambers of said motor,

wherein said independently operable member is a thrust body, said interior space is a thrust chamber which contains said member therein, and

wherein thrust flow control means are provided to drive said thrust member against a spring means which opposes a movement of said thrust body towards said spring means.

4,456,431

AXIAL VENTILATOR WITH PROTECTED BLADES

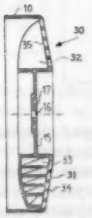
M. Joël Crespin, La Verpillere, France, assignor to L'Unite Hermetique, La Verpillere, France

Filed Oct. 14, 1981, Ser. No. 311,187

Claims priority, application France, Oct. 17, 1980, 80 22273

Int. Cl.³ F04D *29/40*

U.S. Cl. 416—189 **11 Claims**



1. An axial ventilator comprising:

a motor shaft;

a hub mounted on said shaft;

at least two blades mounted on said hub; and

a protection device comprising a protective grille fixed with respect to said blades for rotation with said blades, said grille consisting only of a plurality of concentric rings, said rings being coaxial with said shaft and being spaced from one another by gaps which are sufficiently small to prevent the passage of foreign bodies.

4,456,432

EMERGENCY SUMP PUMP AND ALARM WARNING SYSTEM

Vincent Mannino, Sterling Heights, Mich., assignor to Jennings Pump Company, Utica, Mich.

Continuation of Ser. No. 200,829, Oct. 27, 1980, abandoned. This application Mar. 1, 1983, Ser. No. 469,834

Int. Cl.³ F04B *49/08, 49/02, 21/00*

U.S. Cl. 417—2 **15 Claims**

1. A sump pump apparatus for pumping liquid from a sump, said sump pump apparatus comprising:

submersible primary pump means, such that said submersible primary pump means is immersible within said sump, for pumping liquid from said sump;

rigid primary conduit means connected to said submersible primary pump means and extending upwardly therefrom for discharging the liquid from said submersible primary pump means externally of said sump;

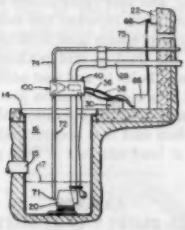
primary switch means, for controlling the operation of said submersible primary pump means in response to the level of liquid in said sump such that said submersible primary

pump means is activated when the liquid level in said sump is above a first predetermined minimum level and such that said submersible primary pump means is deactivated when the liquid level in said sump is below said first predetermined minimum level;

secondary pump means for pumping liquid from said sump upon failure of said submersible primary pump means, said secondary pump means being mounted to said rigid primary conduit means at a location above the top of said sump;

secondary conduit means, connected to said secondary pump means and extending downwardly therefrom into said sump, for drawing liquid from said sump in response to the operation of said secondary pump means;

tertiary conduit means connected to said secondary pump



means and extending away therefrom for discharging the liquid from said secondary pump means externally of said sump;

secondary switch means, for controlling the operation of said secondary pump means in response to the level of liquid in said sump such that said secondary pump means is activated when the liquid level in said sump is above a second predetermined minimum level and such that said secondary pump means is deactivated when the liquid level in said sump is below said second predetermined minimum level, said second predetermined minimum level being higher than said first predetermined minimum level; and

alarm means, connected in parallel with said secondary pump means, for providing a warning when said secondary pump means is activated.

4,456,433

METHOD FOR ASSEMBLING A SINGLE-FLOW TURBOMOLECULAR VACUUM PUMP, AND A TURBOMOLECULAR VACUUM PUMP ASSEMBLED BY SAID METHOD

Hans-Heinrich Henning, Cologne, and Hansen Pfaff, Erftstadt, both of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

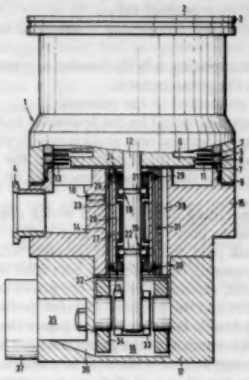
Filed Sep. 18, 1981, Ser. No. 303,666

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1980, 3039196

Int. Cl.³ F04B *35/04*; F01D *1/36*

U.S. Cl. 417—53 **4 Claims**

1. In a turbomolecular vacuum pump having a pump rotor, a drive rotor, a rotor shaft connecting the former, a pump casing, two antifriction bearings for mounting the rotor shaft in the pump casing, and means for resilience between the rotor shaft and the pump casing, the improvement wherein the pump rotor, the drive rotor, the rotor shaft, and the antifriction bearings form a rotationally balanced unit for mounting in the pump casing, the antifriction bearings being rigid, the unit further comprising a cage receiving both the antifrication



bearings, and the means for resilience being between the cage and the pump casing.

4,456,434

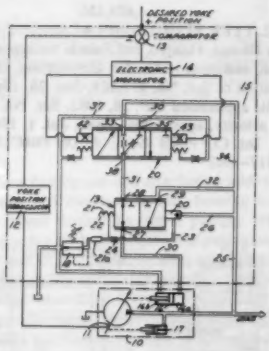
POWER TRANSMISSION

Yehia El Ibiary, Troy, Mich., assignor to Vickers, Incorporated, Troy, Mich.

Filed Mar. 1, 1982, Ser. No. 353,529

Int. Cl.³ F04B *1/26*

U.S. Cl. 417—218 **14 Claims**



1. A variable displacement pump control system comprising

a variable displacement pump having a movable element for controlling pump displacement,

a hydraulic motor for moving said movable element,

a control module comprising a transducer for producing an electric signal corresponding to the actual position of the movable element,

means for producing an electrical signal corresponding to the desired pump displacement,

means for comparing the electrical signal from the transducer and the electrical signal corresponding to the desired displacement and producing an error signal,

and means operable in response to said error signal to meter fluid flow from the pump output to the hydraulic motor,

said last mentioned means comprising an electrically operated valve,

said control module includes an electronic modulator for converting the error signal to a pulse train signal having a

pulse width proportional to the magnitude of the error signal,

said last mentioned means comprising an electro hydraulic three-way flow control valve,

said control valve comprising a solenoid operated servo valve,

said valve comprising a body having a pressure port connected to the pump output,

a tank port connected to the reservoir,

a service port connected to the hydraulic motor,

a spool having a service port portion which serves to cut off fluid flow between the service port of the valve and the pressure port or the tank port depending on the position of the spool,

said spool including a service land which controls the flow from pressure port to service port and from the service port to tank port, the width of the land being slightly less than the opening of the service port such that in the neutral position, restricted orifices are provided between the service port and the pressure and tank ports thereby venting the hydraulic motor to tank to insure the positioning of the movable element of the pump at its full stroke position,

said spool being formed with an axial passage intersected by a radial passage that is at all times in communication with the tank port,

said axial passage connecting opposed ends of the spool with the tank port through a restriction formed therein,

said spool having a pair of radial passages, each of which is in communication with each end of the spool at all times but upon movement of the spool in either direction fluid flow from one fluid chamber to the other is restricted by an orifice thereby dampening the movement of the spool and improving the response to energization of one or the other of the solenoids.

4,456,435

SCROLL TYPE FLUID DISPLACEMENT APPARATUS

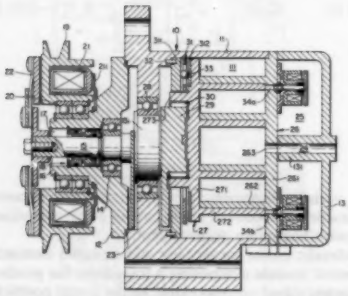
Masaharu Hiraga, Hoajyo, and Seiichi Sakamoto, Gunma, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Continuation of Ser. No. 277,109, Jun. 25, 1981, abandoned. This application Oct. 28, 1983, Ser. No. 546,632

Claims priority, application Japan, Jul. 1, 1980, 55-90391

Int. Cl.³ F04B *49/02, 49/06;* **F04C** *18/02*

U.S. Cl. 417—302 **17 Claims**



1. In a scroll type fluid displacement apparatus including a housing, a fixed scroll member fixedly disposed relative to said housing and having a first end plate from which a first wrap extends into the interior of said housing, an orbiting scroll member having a second end plate from which a second end wrap extends and said first end and second wraps interfitting at an angular and radial offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, a driving mechanism including a rotatable drive shaft connected to said orbiting scroll member to effect orbital motion of said orbiting scroll member, and a rotation preventing mechanism connected to said orbiting scroll member during the orbital motion of said orbiting scroll member, whereby said fluid pockets change volume by the orbital motion of said orbiting scroll member the improvement comprising, control means for controlling the volume at which said fluid pockets begin operating on the fluid to control the displacement volume of said apparatus, said control means including at least two holes formed through one of said end plates at symmetrical positions and valve means for controlling the passage of fluid through said holes, said holes being located within an area where during the orbiting of said orbiting scroll member said at least one pair of fluid pockets are initially formed to begin normal operation of the apparatus on the fluid and in the path of the movement of said second wrap and spaced inward of the points where said first and second wraps initially contact to form said fluid pockets, said holes being in communication with a low pressure area within said housing, and said valve means in an open position providing communication between the initially formed fluid pockets and said low pressure area to delay the operation of said apparatus on the fluid in said pockets until the second wrap passes over said holes to seal said pockets from said low pressure area, and in a closed position preventing passage of fluid past said holes so that the operation of said apparatus on the fluid begins when said first and second wraps contact to initially form said at least one pair of fluid pockets.

4,456,436

ROTARY FUEL SUPPLY UNIT WITH MATCHED MATERIALS FOR THE ROLLERS AND RUNNING TRACK

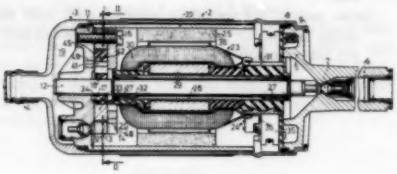
Rainer Schillinger, Stuttgart; Karl Ruhl, Gerlingen; Ulrich Kemmner, Sachsenheim, and Hans Schüler, Kornwestheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

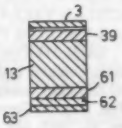
Continuation of Ser. No. 47,443, Jun. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 823,780, Aug. 11, 1977, abandoned. This application Apr. 29, 1983, Ser. No. 487,601

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1976, 2637980

Int. Cl.³ F04B *17/00;* **F04C** *2/00, 15/00;* **B32B** *27/06*

U.S. Cl. 417—366 **4 Claims**





1. In a fuel supply unit comprising a pump and an electromotor, the pump including: two stationary side plates; an intermediate plate; a pump rotor, the intermediate plate being situated eccentrically with regard to the pump rotor, said intermediate plate having a running track defining a circular clearance within which the rotor is located, with the clearance between the rotor and the running track defining a crescent-shaped pumping space, said rotor having axially aligned grooves

formed therein which open outwardly toward the running track of the intermediate plate; and a roller situated in each groove, each roller having a hardened coating on its rolling surface, said rollers being raidally displaceable by centrifugal force into the pumping space in rolling contact with said running track, said running track being constructed as a multilayered bushing inserted within the circular clearance of the intermediate plate, said bushing consisting of an outer layer of steel, an intermediate layer of sintered metal impregnated with a synthetic resin, and an inner layer of said synthetic resin on which said rollers run.

4,456,437

REFRIGERANT COMPRESSOR

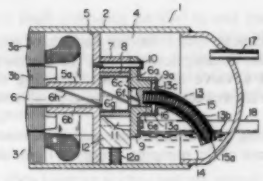
Takahisa Kurahayashi, Fujisawa, and Juji Ojima, Ebina, both of Japan, assignors to Matsushita Reiki Co., Ltd., Osaka and NHK Spring Co., Ltd., Kanagawa, both of, Japan

Filed Dec. 21, 1981, Ser. No. 333,062

Claims priority, application Japan, Dec. 22, 1980, 55-182681

Int. Cl.³ F04B *39/02*; F04D *29/28*; F01M *1/00*; F04C *29/02*

U.S. Cl. 417—368 **5 Claims**



1. A refrigerant compressor comprising: a case encasing a compressor section and a driving section including an electric motor; a crank shaft adapted to be driven by the rotor of said electric motor; an oil pipe connected at its one end to an opening of an attaching base fixed to a bearing of said crank shaft, the other end of said pipe being immersed in the lubricating oil collected in said case, said opening of said attaching base being substantially concentric with said crank shaft; said crank shaft having a journal portion, an eccentric portion and a main shaft portion, said journal portion being rotatably supported by said bearing which cooperates with said attaching base in defining an oil pressure chamber; and a closely-coiled spring received by said oil pipe, said coiled spring being fixed at its one end to one end of said crank shaft with the other end being immersed in said oil through an end opening of said oil pipe, said closely-coiled spring being screwed at its one end into a threaded bore formed in said end of said crank shaft, with the other end having a conical form.

4,456,438

EXTRUSION DEVICE FOR IMPREGNATING A ROCK FORMATION, PREFERABLY FOR BONDING WITH A LIQUID SYNTHETIC PRODUCT

Manfred Fischbach, Glückaufstr. 3c, D-4320 Hattingen, and Rolf Hebben, Hohe Egge Höhenweg 12, D-4322 Sprockhövel, both of Fed. Rep. of Germany

Filed Apr. 29, 1982, Ser. No. 373,065

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1981, 3117027

Int. Cl.³ F04B *19/02*

U.S. Cl. 417—403 **3 Claims**

1. An extrusion apparatus for impregnating rock formations in underground excavations with a liquid synthetic bonding compound, said apparatus comprising:

a base member;

a container mounted to said base member;

working cylinder means mounted to said base member, said working cylinder means having at least one working cylinder member comprising:

a housing member having a bore extending therethrough;

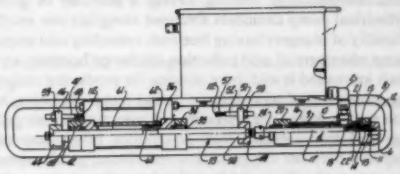
ball check valve means mounted at one end of said bore of said housing member for selectively sealing said one end of said bore;

stop means located about the other end of said bore;

a piston rod member having one end mounted in said bore of said housing member and an opposite end extending from said housing member, said piston rod member adapted to move from a first predetermined position to a second predetermined position;

a hollow piston member interposed between said housing member and said piston rod member, said hollow piston member adapted to move with said piston rod member between a first intake position and a second delivery position when said piston rod member moves between said first and said second predetermined positions, said first intake position defined by an abutment of said hollow piston member and said stop means;

sealing and engaging means interposed between said piston rod member and said hollow piston member for slidingly sealing and engaging said one end of said piston rod member with said hollow piston member to define a housing chamber between ball said check valve means and said one end of said piston rod member; said sealing and engaging means causing said hollow piston member to move with said piston rod member between said first intake position and said second delivery position when said piston rod member moves between said first and said second predetermined positions;



conduit means having one end attached to said container and an opposite end mounted to said housing member, said conduit means further having a passage with one end communicating with the contents of said container and an opposite end communicating with said housing chamber such that the contents of said container may be communicated to said chamber;

driving means for reciprocally moving said piston rod member between said first and second predetermined positions, said driving means being mounted to said base member in an axial spaced relationship with said working cylinder means such that said driving means reciprocates said piston rod member from said first predetermined position whereby said hollow piston member is moved to said first intake position to allow said liquid synthetic bonding compound of said container to be drawn into said housing chamber, said ball check valve means sealing said one end of said bore of said housing when said hollow piston member is moved to said first intake position, said driving means further moving said piston rod member to said second predetermined position whereby said hollow piston member is moved to said second delivery position to deliver said liquid synthetic bondings compound past said ball check valve means and expel said liquid synthetic bonding compound from said bore; and

means for mounting said working cylinder means to said base member.

4,456,439

HIGH PRESSURE PLUNGER PUMP

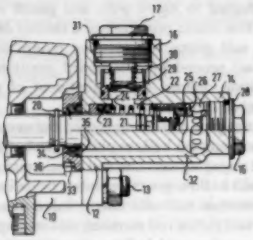
Horst Wolff, Gereisried, Fed. Rep. of Germany, assignor to Speck-Kolbenpumpen-Fabrik, Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 318,266

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041933

Int. Cl.³ F04B *39/14, 21/00, 23/06*

U.S. Cl. 417—454 16 Claims



1. A high pressure plunger pump for forwarding liquid at high pressures, the pump comprising a drive housing; an induction-discharge housing mounted on said drive housing, said induction-discharge housing having a plurality of generally cylindrical pump chambers arranged alongside one another; a plurality of plungers having free ends extending into respective pump chambers of said induction-discharge housing; a crankshaft journalled in said drive housing for producing reciprocating movement of said plungers in said pump chambers; induction and discharge chambers for said induction-discharge housing; and spring biased inlet and outlet valves respectively disposed between the induction and discharge chambers and the pump chambers, with said inlet valves being arranged alongside one another in axial extensions of the pump chambers and said outlet valves being arranged alongside one another to one side of said pump chambers, or vice versa; wherein said induction-discharge housing is a one piece housing of substantially L-shaped cross-section when viewed in a plane at right angles to said crankshaft, said L-shaped housing having first and second limbs and first and second ends extending in planes substantially at right angles to said crankshaft; wherein the inlet valves and the outlet valves are arranged in respective ones of said first and second limbs; wherein each of said inlet and outlet valves is secured in position by a respective threaded plug; wherein each of said induction and discharge chambers are passages of circular cross-section extending between said first and second ends of said housing, with the passage defining said induction chamber intersecting said axial extensions of said pump chambers; wherein respective high and low pressure seals are associated with each said plunger, said high pressure seals being arranged in said induction-discharge housing around said plungers adjacent said drive housing and said low pressure seals being positioned in a scavenge circulation established by first and second connection passages extending between chambers accommodating the low pressure seals and said induction chamber; wherein said low pressure seals are arranged between the induction-discharge housing and the drive housing, and wherein the low pressure seals are arranged in a carrier part there being recesses formed in this carrier part to accommodate the low pressure seals with said recesses being connected together via shallow channels for the purpose of ensuring the scavenge circulation.

4,456,440

VALVE ASSEMBLY FOR HIGH-PRESSURE PUMPS

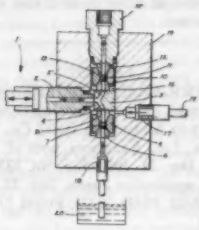
Jorg P. Korner, Hagen, Fed. Rep. of Germany, assignor to Uhde GmbH, Dortmund, Fed. Rep. of Germany

Filed Mar. 8, 1982, Ser. No. 355,525

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 3111614

Int. Cl.³ F04B *39/00, 21/02*

U.S. Cl. 417—540 4 Claims



1. In a hydraulic system having a source of pumping energy, a surge vessel communicating with the discharge line of the system, and a valve assembly for directing the fluid flow wherein the improvement resides in the valve assembly comprising:

(a) a housing including passage means communicating with the source of the pumping energy, a fluid inlet, and a fluid outlet;

(b) a suction valve disposed in said passage means and communicating with the inlet of said housing;

(c) a discharge valve disposed in said passage means and communicating with the outlet of said housing;

(d) a distribution section disposed in said passage means between said suction valve and said discharge valve, and providing communication between the source of pumping energy and said suction valve and said discharge valve; said suction valve and said discharge valve and said distribution section cooperating to define a free space within the interior of said housing; and

(e) means for effecting communication between the free space defined by said suction valve and said discharge valve and said distribution section, and the interior of said housing and the outlet of the surge vessel, whereby the pressure acting on said suction valve and said discharge valve within the interior of said housing is regulated by pressure downstream of the surge vessel.

4,456,441

ROTARY MACHINE

Aharon Zilinsky, 26 Tel Hai St., Ramath Gan, Israel

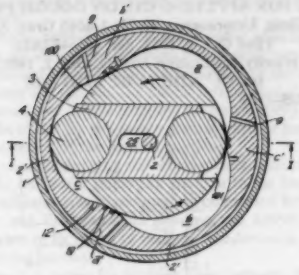
Filed Feb. 23, 1982, Ser. No. 351,604

Int. Cl.³ F01C *1/00, 17/02, 19/00*

U.S. Cl. 418—147 4 Claims

1. Rotary machine, such as an internal combustion engine, a compressor or a pump, comprising a circular casing having an axis, a hollow cylindrical body coaxially arranged within and having a shaft rotatably journalled in said circular casing, said hollow cylindrical body has an internal wall face extending in the axial direction of and circumferentially around the axis of said casing and laterally describing a working space limited at said wall face by alternating outwardly extending recesses and radially inwardly directed ribs spacing said recesses apart in the circumferential direction, each said recess being diametrically opposite one of said radially inwardly directed ribs, at least one solid cylindrical body having an axis extending parallel with the axis of said casing and said hollow cylindrical body and positioned within said working space, a throughgoing bore extending across the axis of said solid cylindrical body, a piston-like member mounted in said throughgoing bore for per-

forming a sliding reciprocal movement therein in the direction transverse to the axis of said shaft of said hollow cylindrical body, said piston-like member having a pair of opposite end faces, a piston-like body mounted in each of said end faces and arranged to contact said internal wall face, each said piston-



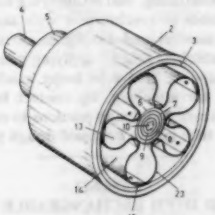
like body has a shaft extending parallel to and spaced radially outwardly from the axis of said solid cylindrical body, a gear wheel secured to each shaft of said piston-like bodies, a gear rim formed in said internal wall face and following the contour of said recesses and said ribs, and said gear wheels disposed in meshed engagement with said gear rim.

4,456,442

ROTARY EXPANSIBLE CHAMBER DEVICE WITH ECCENTRIC ROTOR ASSEMBLY INCLUDING A FLEXIBLE BAND

Romano Gnagnetti, Strada Trasimeno Ovest, 283, 06100 Perugia-Olmo, Italy

Filed Jun. 4, 1981, Ser. No. 270,688
Int. Cl.³ F01C *5/06*; F03C *2/00*
U.S. Cl. 418—153 **7 Claims**



1. A rotary expansible chamber device, comprising,

an outer housing,

a rotor assembly which includes a cylindrical rotor body, a flexible band and a cylindrical inner member,

said cylindrical rotor body being located in said housing and being rotatable about a rotor axis which is concentric with respect to said outer housing,

said cylindrical inner member of the rotor assembly being located within and spaced from the rotor body,

said flexible band connecting the inner member to the rotor body and being provided with spaced portions of opposite curvature so that it forms a set of circumferentially spaced lobate chambers which are located between the rotor body and the inner member of the rotor, said flexible band being affixed at longitudinally spaced locations to the interior of said cylindrical rotor body and to the exterior of said cylindrical inner member,

means for supporting the inner cylindrical member for rotational movement about an axis which is eccentric with respect to the rotor axis whereby rotation of the rotor assembly will produce expansion and contraction of said chambers,

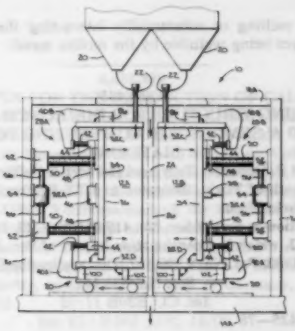
said housing having circumferentially spaced inlet and outlet openings in communication with the lobate chambers formed by said flexible band.

4,456,443

MACHINE FOR STEAM CHEST MOLDING OF FOAMED MATERIAL

John Rabotski, Sheboygan, Wis., assignor to Design Engineering Service Inc., Sheboygan, Wis.

Filed Nov. 26, 1982, Ser. No. 444,794
Int. Cl.³ B29D *27/00*
U.S. Cl. 425—4 R **9 Claims**



1. A machine for molding sheets of foamed material, comprising:

an upright stationary steam chest having means for discharging fluids along one face thereof;

a movable mold frame extending normal to the face of said steam chest and abuttable therewith;

a platen movably mounted within the mold frame and positioned in opposition to said steam chest, said platen having means for discharging fluid along a face thereof disposed in opposition to the face of said steam chest, said platen cooperating with said steam chest and mold frame to define a mold cavity;

means coupling said platen to said mold frame for moving said platen relative to said mold frame toward and away from the stationary steam chest; and

means for moving said mold frame into and out of abutment with said steam chest.

4,456,444

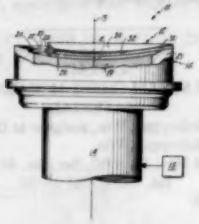
MODIFIED RSR ROTARY ATOMIZER

Robert J. Patterson, II, 496 SW. Eastport Cir., Port St. Lucie, Fla. 33452

Filed Dec. 27, 1982, Ser. No. 453,197
Int. Cl.³ B01J *7/14*
U.S. Cl. 425—8 **6 Claims**

1. Rotary atomization means comprising disk means having an axis and means for rotating said disk means about said axis, said disk means including a disk body and an upper concave surface adapted to receive a stream of molten metal thereon as it rotates, said disk body having a central ceramic component secured thereto, said ceramic component being of sufficient thickness to provide thermal insulation for said disk body, said ceramic component having a concave upwardly facing surface, said disk means including a metal layer covering said concave upwardly facing ceramic surface and bonded thereto,

said metal layer defining said upper concave surface of said disk means and adapted to receive said molten metal stream



without melting or substantially interacting therewith, said metal layer being wettable by the molten metal.

4,456,445

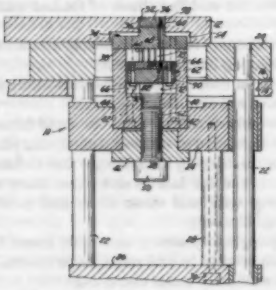
MOUNTING STRUCTURE FOR DIE, PUNCH AND CORE ROD ASSEMBLY FOR COMPACTING POWDER MATERIAL

Raymond P. DeSantis, Troy, and Herbert J. Puffer, Jr., Garden City, both of Mich., assignors to PTX-Pentronix, Inc., Lincoln Park, Mich.

Continuation-in-part of Ser. No. 419,815, Sep. 20, 1982, Pat. No. 4,427,352, which is a continuation-in-part of Ser. No. 351,482, Feb. 23, 1982, Pat. No. 4,390,335. This application Sep. 19, 1983, Ser. No. 533,111

Int. Cl.³ B30B *11/02*

U.S. Cl. 425—78 **15 Claims**



1. In a punch and die assembly for a powder compacting press comprising a die plate, at least one punch reciprocable relative to said die plate and at least one core rod stationary relative to said die plate, said core rod having an end slidably disposed in a bore through said punch, a punch base member connected to a reciprocable platen supporting said punch, a core rod support block disposed in a recess within said punch base member and having integral support arms projecting through slots in said punch base member, means for attaching the end of said arms below said die plate and means mounting the other end of said core rod in said core rod support block and providing longitudinal adjustment of said core rod relative to said core rod support block, the improvement comprising a first bore in said core rod support block for passage therethrough of said other end of said core rod, a second bore in said core rod support block axially aligned with said first bore, said second bore being internally threaded and having a larger diameter than said first bore, abutment means in said second bore, a threaded member having an axial bore aligned with said first bore and slidably accepting said other end of said core rod, and collet clamping means in said threaded member for gripping said other end of said core rod when said threaded member is threaded in said second bore for forcibly engaging an end of said threaded member with said abutment means in said second bore.

4,456,446

DEVICE FOR APPLYING OIL ON DOUGH PORTIONS

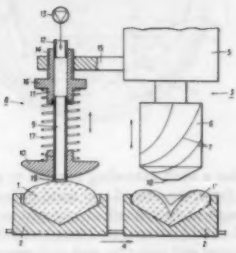
Helmut König, Ursprungweg 70-72, A-8045 Graz, Austria

Filed Oct. 4, 1982, Ser. No. 432,623

Claims priority, application Austria, Oct. 2, 1981, 4238/81

Int. Cl.³ A21C *11/02*; A21D *8/08*

U.S. Cl. 425—102 **12 Claims**



1. A machine for molding and oiling dough portions, comprising:

a vertically reciprocatable mold member and a reciprocatable support therefor,

a support means for carrying a dough portion to be molded to a position below said mold member, said mold member having means for penetrating into the surfaces of said dough portions and producing cuts on surface areas of said dough portions,

oil applying means for applying oil to said dough portions before said dough proportions are contacted by said means for penetrating, said oil applying means being vertically moveable in synchronism with said movement of said mold member and having an oil supply tube and means for attaching said oil applying means to said reciprocatable support, said tube being axially moveable, in said means for attaching, by contact between said oil supplying means and dough portions to cause oil to enter said supply tube and to coat said dough portions.

4,456,447

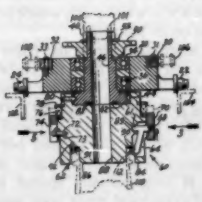
CARRIER WITH EXCHANGEABLE CHUCK

Roger D. Smith, Bethel, Ohio, assignor to Cincinnati Milacron Inc., Cincinnati, Ohio

Filed Mar. 5, 1982, Ser. No. 355,224

Int. Cl.³ B29C *17/07*; B65G *47/06*

U.S. Cl. 425—182 **5 Claims**



1. An article carrier for use in a reheat and blow molding machine for forming a finished article from a thermoplastic article preform having a formable portion and a formed por-

tion, the formable portion being expanded in a mold cavity of the molding machine by injection of an expansion fluid into the preform after adjusting the temperature thereof to the molecular orientation temperature, the carrier comprising:

(a) a carrier body;

(b) a spindle rotatably supported within the carrier body and having a passage therethrough for admission of the expansion fluid;

(c) an article gripping chuck removeably attached to the spindle for releasably retaining article preforms and having a passage therethrough for admission of the expansion fluid from the spindle, the chuck further including:

(1) at least two article gripping levers rotatably mounted on the chuck for releasably grasping article preforms by the exterior of the formed portion;

(2) a lever actuator ring slidably disposed upon the outside of the chuck for imparting rotation to the levers; and

(3) an actuator ring biasing means connected between the ring and the chuck for holding the actuator at one extreme of its travel to maintain the levers in an article retaining position;

(d) first sealing means for forming a seal between the spindle and the chuck sufficient to withstand the forces of expansion; and

(e) second sealing means for forming a seal between the chuck and the article sufficient to contain the expansion fluid admitted to the article preform.

4,456,448

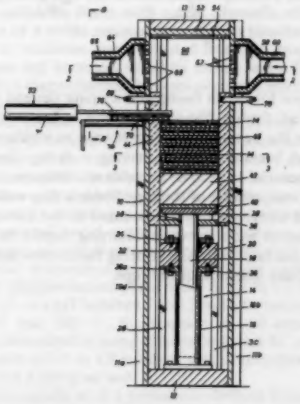
MOLDING APPARATUS

Aaron J. Pippert, Houston, Tex., assignor to Utex Industries, Inc., Houston, Tex.

Filed Jun. 4, 1982, Ser. No. 221,620

Int. Cl.³ B29C *1/16, 3/02*

U.S. Cl. 425—234 **17 Claims**



1. A molding apparatus comprising:

a curing chamber, said curing chamber being at least partially defined by first and second end walls, said second end wall being movable toward and away from said first end wall;

a lateral opening for introducing a molding assembly into and removing a molding assembly from said curing chamber, said lateral opening lying between said first and second end walls when said second end wall is farthest from said first end wall;

a mold stack disposed in said chamber, said mold stack including at least a first molding assembly and a second molding assembly, each of said molding assemblies comprising a first mold frame and a second mold frame, said first and second mold frames including first and second registering formations to define at least one mold cavity, and means defining a plurality of open ended passageways between said mold cavities in said first and second molding assemblies and extending from a first side of said mold stack to a second, opposed side of said mold stack;

means for circulating a heated, gaseous medium within said curing chamber and through said passageways into direct, heat exchange contact with said molding assemblies;

means to selectively maintain said curing chamber substantially closed; and

means to compress said mold stack in said curing chamber between said first and second end walls.

4,456,449

APPARATUS FOR THE PRODUCTION OF CALCIUM SILICATE-CONTAINING STONE BLANKS USEFUL IN CONSTRUCTING BUILDING WALLS

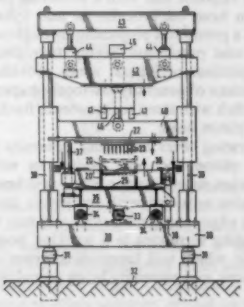
Peter Schubert; Hermann Pfeifer, both of Aachen; Volker Hermann, Bad Schwalbach; Reimund Keller, Hattingen, and Eckhard Schulz, Wallenhorst, all of Fed. Rep. of Germany, assignors to SICOWA Verfahrenstechnik für Baustoffe GmbH & Co. KG, Aachen, Fed. Rep. of Germany

Division of Ser. No. 256,614, Apr. 22, 1981, Pat. No. 4,376,086. This application Dec. 15, 1982, Ser. No. 450,084

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1980, 3015432

Int. Cl.³ B28B *5/00, 13/00*

U.S. Cl. 425—253 **6 Claims**



1. An apparatus for the production of calcium silicate based stone blanks, comprising

means for preparing a pourable crude mixture from granulated silicate-containing material, lime, water, a cement and foam;

means for pouring said crude mixture into at least one mold;

said mold comprising a cover, a bottom and side plates, at least one of said plates being movable to open and close said mold;

heating means for heating said crude mixture in said mold essentially uniformly to a temperature between 45° C. and 90° C. until achieving the desired blank-strength by strength-forming reactions of the cement in said crude mixture;

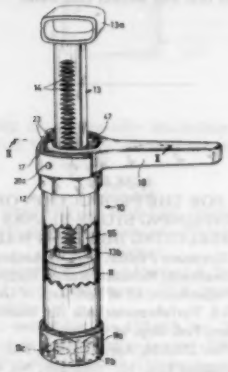
said heating means being a high frequency voltage heating using two parts of said mold as condensor plates being connectable with a high frequency voltage source; and

means for removing the formed stone blanks from the mold and for transferring them to a transport station.

4,456,450
MANUAL EXTRUDER FOR SHAPING PASTA OR SIMILAR PRODUCTS

Paul Heling, Solingen, Fed. Rep. of Germany, assignor to Gerdes GmbH & Co., Schwelm, Fed. Rep. of Germany

Filed Apr. 20, 1983, Ser. No. 486,921
Claims priority, application Fed. Rep. of Germany, Apr. 24, 1982, 3215362
Int. Cl.³ B29F *3/01*; A21C *3/04, 11/18*
U.S. Cl. 425—376 R 20 Claims



1. A manually operable press for the extrusion of a pasty mass through at least one shaping aperture, comprising:

a cylinder provided at one end with an extrusion nozzle and at an opposite end with a mounting member;

a piston head reciprocable in said cylinder and provided with a piston rod projecting through said mounting member, said piston rod having two diametrically opposite longitudinal peripheral zones provided with respective serrations of generally sawtooth-shaped profile and identical pitch with steep rear sawteeth flanks facing away from said piston head;

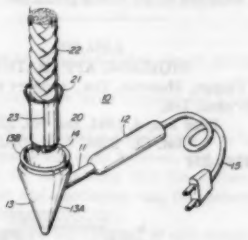
an operating lever extending generally perpendicularly to said piston rod and having an extremity with two branches straddling the latter, said branches having inner surfaces provided with respective driving pawls having front edges engageable with said rear flanks of the corresponding serrations in a working position of said piston rod in which said longitudinal zones confront said inner surfaces, said extremity being articulated to said mounting member for swinging about a pivotal axis skew to the cylinder axis and more remote than said driving pawls from a free end of said lever, said lever being limitedly swingable in an axial plane of said cylinder about said pivotal axis for advancing said piston head toward said extrusion nozzle through the intermediary of said driving pawls on a forward swing and for retracting said driving pawls from said serrations on a reverse swing; and

detent means on said mounting member resiliently engageable with said serrations in said working position for backstopping said piston rod upon an advance thereof by said driving pawls, said piston rod being rotatable into an idle position in which said serrations are disaligned from said feed pawls and from said detent means.

4,456,451
APPARATUS FOR SHAPING ROPE ENDS

George W. Vosper, 149 Earl St., Kingston, Ontario, Canada (K7L 2H3)

Filed Sep. 29, 1982, Ser. No. 427,444
Int. Cl.³ B29J *1/00*
U.S. Cl. 425—392 7 Claims



1. A device for use in fusing and shaping the end of a rope made of heat fusible fibers comprising a heatable element mounted on the free end of a stem having an insulated handle thereon said heatable element having a cavity therein and made of a material so as to be heatable to a temperature above the melting temperature of the rope fibers, a thin-walled, conically-shaped insert removably mounted in the cavity of said heatable element and a sleeve for inserting therein the end of a rope to be heat fused, said sleeve being flared outwardly at one end to facilitate insertion of the rope.

4,456,452

PROCESS FOR BLEACHING TEXTILES AND FOR COMBATING MICROORGANISMS WITH SULPHONATED PHTHALOCYANINE CARRYING HALOGEN OR PSEUDOHALOGEN SUBSTITUENTS AS PHOTOACTIVATOR

Gerd Hölzle, Liestal; Gerhard Reinert, Allschwil, and Rudolf Polony, Basel, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 298,229, Aug. 31, 1981, Pat. No. 4,394,125.
This application Mar. 28, 1983, Ser. No. 479,401
Claims priority, application Switzerland, Sep. 9, 1980, 6764/80; Sep. 9, 1980, 6765/80
Int. Cl.³ C09B *47/04*; C11D *3/39*
U.S. Cl. 8—103 23 Claims

1. In a process for bleaching a textile by treating the textile with one or more water-soluble phthalocyanines selected from the group consisting of the sulfonated zinc phthalocyanines and the sulfonated aluminum phthalocyanines, in the presence of water and under irradiation with light, the improvement which comprises using a phthalocyanine which is further substituted by a halogen atom or a pseudohalogen group.

4,456,453

METHOD OF OXIDIZING AND SIMULTANEOUSLY FIXING SULFUR DYESTUFFS ON CELLULOSIC FIBERS

Jean Balland, Chateaurenault, France, assignor to Manufacture de Produits Chimiques Protex, Paris, France

PCT No. PCT/FR82/00009, 371 Date Sep. 15, 1982, 102(e) Date Sep. 15, 1982, PCT Pub. No. WO82/02565, PCT Pub. Date Aug. 5, 1982
PCT Filed Jan. 15, 1982, Ser. No. 425,075
Claims priority, application France, Jan. 19, 1981, 81 01183
Int. Cl.³ D06P *1/30, 3/60*
U.S. Cl. 8—554 5 Claims

1. A process for the simultaneous oxidation and fixation of dye on cellulosic fibers with sulfur dyestuffs, effected in the presence of a stable aqueous formulation simultaneously containing an oxidation agent selected from the group consisting of iodates and bromates of alkali metals and a fixation agent which is a thermohardenable cationic resin selected from the group consisting of

reaction products of a polyester resin having a carboxylic group at the end of a chain with an epoxyamine addition compound the reaction being followed by a condensation with epichlorohydrin;

polyester-polyamide copolymers soluble in water and obtained by reacting a saturated or unsaturated aliphatic dicarboxylic acid containing 3 to 10 carbon atoms with a mixture of polyalkylenic polyamine and dialkanolamine in molar proportions of the dicarboxylic acid/polyamine/and dialkanolamine of the order of 0.8 to 1.1/0.3 to 0.9/0.1 to 0.7, at a pH between 1 and 3 and a temperature between 120° and 200° C., the reaction of said copolymer with epichlorohydrin being effected between 45° and 100° C. at a ratio of 0.5 to 1.8 moles of epichlorohydrin per atom of active hydrogen; and

reaction products of a polyamide derived from a polyalkylenic polyamide and a saturated, aliphatic, dicarboxylic acid containing 3 to 10 carbon atoms, with epichlorohydrin alone or conjointly with a quaternization agent.

4,456,454

MANNICH REACTION PRODUCT FOR MOTOR FUELS

Robert H. Jenkins, Jr., Walden, N.Y., assignor to Texaco Inc., White Plains, N.Y.

Filed Jun. 23, 1983, Ser. No. 507,267
Int. Cl.³ C10L *1/22*
U.S. Cl. 44—73 13 Claims

1. A motor fuel composition for an internal combustion engine comprising a base fuel, selected from the group consisting of (a) a mixture of hydrocarbons in the gasoline boiling range, (b) fuel-grade ethanol, and (c) mixtures of (a) and (b), and an effective carburetor detergent and rust inhibiting amount of a Mannich reaction product prepared by reacting in substantially equal molar amounts malonic acid, formaldehyde and an amine represented by a formula selected from the group consisting of:

$$R-NH_2, \text{ and } R-\overset{H}{\underset{|}{N}}-CH_2-CH_2-CH_2-NH_2$$

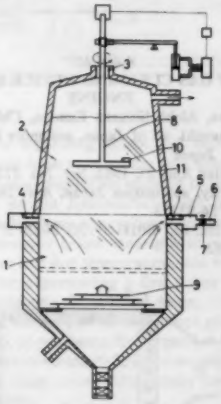
in which R is a hydrocarbyl radical having from about 6 to 20 carbon atoms.

4,456,455

TWO STAGE COAL GASIFICATION PLANT

Neville M. Shoebotham, Benoni, South Africa, assignor to Fluidised Bed Combustion (Proprietary) Limited, South Africa

Filed Mar. 23, 1982, Ser. No. 360,979
Claims priority, application South Africa, Mar. 23, 1981, 81/1910
Int. Cl.³ C10B *9/00*
U.S. Cl. 48—85.2 3 Claims



1. A two stage coal gasification plant comprising a predistillation retort in surmounted relation to a gasifier, the gasifier having a plurality of gas extraction outlets located around the periphery thereof, an agitator comprising a shaft being mounted for rotation in the predistillation retort and including at least one projection which projects transversely relative to the shaft and adapted to effect agitation of coal on rotation of the shaft, the rotational axis of the shaft being substantially coincident with that of the predestillation retort, the elevation of the projetion being adjustable relative to the predistillation retort, the agitator including temperature sensing means thereon, and control means for adjusting the elevation of the projection relative to the predistillation retort in response to the temperature sensed by the temperature sensing means.

4,456,456

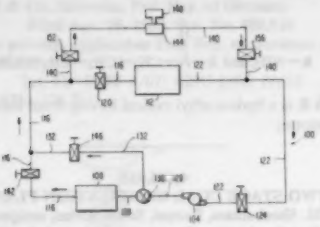
HOT-WATER HEATING SYSTEM HAVING AN AIR ELIMINATOR

Francesco Pompei, Wayland, Mass., assignor to Amtrol Inc., West Warwick, R.I.

Filed Sep. 30, 1982, Ser. No. 430,280
Int. Cl.³ B01D *19/00*
U.S. Cl. 55—203 9 Claims

1. An improved forced-liquid, closed, flow circulatory system comprising a closed circulatory liquid-flow network, means for forcing said liquid to flow through said closed circulatory network, a by-pass line around the region where the

lowest gas solubility in the liquid occurs in said closed circulatory network, and gas-liquid separator means located in said



by-pass line, whereby said separator means separates gas from said liquid and expels said gas from said closed circulatory network.

4,456,457

EXHAUST GAS CLEANING DEVICE FOR DIESEL ENGINE

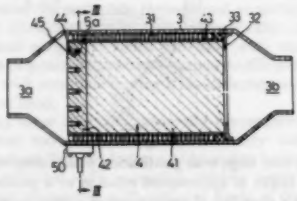
Masaei Nozawa, Aichi; Shigeru Kamiya, Chiryu, and Hitoshi Yoshida, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 27, 1982, Ser. No. 372,376

Claims priority, application Japan, Apr. 28, 1981, 56-64435; May 29, 1981, 56-83273

Int. Cl.³ B01D *39/20*; F01N *3/02*

U.S. Cl. 55—283 **10 Claims**



1. An exhaust gs cleaning device including a casing having an inlet and outlet for collecting carbon particulates in exhaust gases emitted from a diesel engine and for heating and burning the collected carbon particulates, comprising:

a filter member positioned in said casing and which collects carbon particulates in exhaust gases flowing therethrough;

said filter member being formed of heat resistant porous material having interconnected fine pores;

said filter member being composed of two filter elements having different cell densities and which closely contact with each other;

one of said two filter elements having a higher cell density being arranged on the upstream side of the other filter element on the inlet side of said casing;

an electrical heating means which heats and burns the collected carbon particulates;

said heating means being provided with at least one heater wire which is buried within said filter element having a higher cell density; and

a heating means operating means which supplies an electric current to said electrical heating means when the amount of carbon particulates collected by said filter member reaches a predetermind amount.

4,456,458

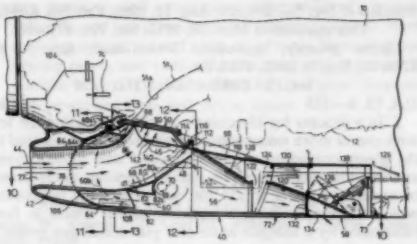
AIR INTAKE SYSTEM FOR ENGINE

Frederick L. Gilbertson, Rexdale, Canada, assignor to The De Havilland Aircraft of Canada, Limited, Downsview, Canada

Filed Sep. 20, 1982, Ser. No. 420,062

Int. Cl.³ B01D *39/00*

U.S. Cl. 55—306 **20 Claims**



1. For use with an engine having an air inlet, a separator for removing foreign particles from the air entering said inlet, said separator comprising:

(a) an air intake duct formed for an intake airstream to flow in a first substantially rearward path therein,

(b) a plenum behind said intake duct,

(c) said intake duct having guide means for separating from said intake airstream a primary airstream and for guiding said primary airstream in a second path at a substantial angle to said first path for passage into said engine inlet,

(d) said intake duct being oriented to discharge substantially rearwardly into said plenum a secondary stream of said air from said intake airstream so that particles entering said intake duct with said air will tend to travel into said plenum with said secondary airstream and will be separated from said primary airstream,

(e) duct means connected to said plenum and formed to guide a third stream of air from said plenum forwardly along a third path substantially separated by said duct means from said second path and then to discharge said third airstream smoothly into said primary airstream,

(f) and means in said plenum for removing foreign particles from said plenum.

4,456,459

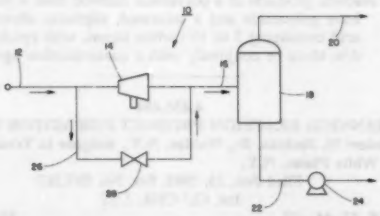
ARRANGEMENT AND METHOD FOR THE PRODUCTION OF LIQUID NATURAL GAS

Virgil L. Brundige, Jr., Grand Prairie, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 7, 1983, Ser. No. 456,234

Int. Cl.³ F25J *3/02*

U.S. Cl. 62—9 **10 Claims**



1. In a liquid natural gas manufacturing facility, an arrangement for improving liquid natural gas production, reducing flash gas production and conserving energy, comprising:

means operating to reduce the pressure of a super-cooled

stream of liquid natural gas feed from a main exchanger of the liquid natural gas manufacturing facility, to extract work from both a liquid phase and a vapor phase formed during the reduction in pressure, and to separate the liquid and vapor phases into streams of liquid natural gas and flash gas;

said means consisting of a hydraulic expander designed to extract work from both the liquid phase and vapor phase formed during the reduction in pressure, a low pressure flash means for separating the liquid and vapor phases, and a first flow conduit for feeding the super-cooled stream of liquid natural gas from the main exchanger to the hydraulic expander and for feeding the liquid and vapor phases exiting from an outlet of the hydraulic expander directly to an inlet of the low pressure flash means.

6. In a method for producing liquified natural gas, a method for improving liquid natural gas production, reducing flash gas production and conserving energy, comprising:

feeding a stream of super-cooled and pressurized liquid natural gas from a main exchanger of a liquid natural gas manufacturing facility to a hydraulic expander means;

conducting the stream through the hydraulic expander to reduce the pressure of the stream and to further cool the stream, said stream forming gas and vapor phases during the pressure reduction;

extracting work from both the liquid and vapor phases during the pressure reduction by means of said hydraulic expander;

feeding the liquid and vapor phases from an outlet of the hydraulic expander directly to a low-pressure flash means without further treatment; and

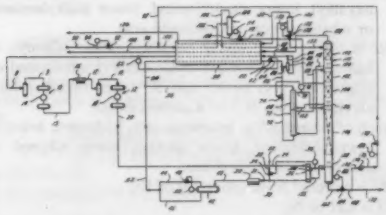
flashing the liquid and vapor phases in the low pressure flash means in order to form separate streams of liquid natural gas and flash gas.

4,456,460

PROCESS FOR RECOVERING ETHANE, PROPANE AND HEAVIER HYDROCARBONS FROM A NATURAL GAS STREAM

Fred P. Apffel, Houston, Tex., assignor to Flexivol, Inc., Houston, Tex.

Filed Mar. 10, 1982, Ser. No. 356,918
Int. Cl.³ F25J 3/02
U.S. Cl. 62—26 5 Claims



1. A process for separating methane and lighter components from substantial amounts of heavier naturally occuring hydrocarbons in a mixed gas, comprising:

A. Cooling the mixed gas in an indirect heat exchanger with a single mixed component refrigerant having at least three components with boiling points corresponding to the condensing points of the heavier hydrocarbons of the mixed gas;

B. Separating the methane and lighter components from substantial amounts of heavier naturally occuring hydrocarbons of the mixed gas in a distillation column using such refrigerant to provide the heat energy for the distillation, such refrigerant being the only supplying heat energy to the column.

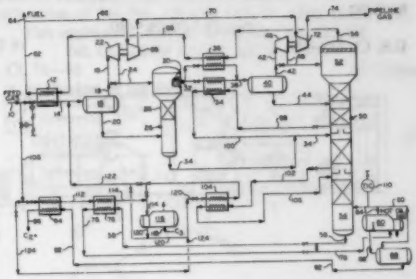
441-177 OG - 84 - 10

4,456,461

SEPARATION OF LOW BOILING CONSTITUENTS FROM A MIXED GAS

Ethelwolbo P. Perez, London, England, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 9, 1982, Ser. No. 416,204
Int. Cl.³ F25J 3/02
U.S. Cl. 62—28 28 Claims



1. A method for separating ethane and higher molecular weight hydrocarbons from a natural gas feed, predominating in methane and containing significant amounts of said ethane and higher molecular weight hydrocarbons and having a first pressure substantially above atmospheric pressure and a first temperature substantially below atmospheric temperature, at which first pressure and first temperature, said feed comprises both a vapor phase, representing a first vapor phase, and a liquid phase, representing a first liquid phase, comprising:

(a) expanding at least a part of said vapor phase, in a first expansion step, to produce a first expanded fluid having a second pressure substantially lower than said first pressure and a second temperature substantially lower than said first temperature;

(b) introducing all of said first expanded fluid and any unexpanded first vapor phase into a separation-contacting zone adjacent the top thereof and introducing all of said first liquid phase into said separation-contacting zone at a lower intermediate point thereof, under conditions and in proportions such that the pressure at the top of said separation-contacting zone is substantially lower than the pressure at the bottom of said separation-contacting zone and the temperature at said top of said separation-contacting zone is substantially lower than the temperature at said bottom of said separation-contacting zone;

(c) separating said first expanded fluid, said unexpanded remaining portion of said first vapor phase and said first liquid phase, in said separation-contacting zone, to produce a second vapor phase and a second liquid phase;

(d) introducing said second vapor phase into a fractional distillation zone adjacent the top thereof and introducing said second liquid phase into said fractional distillation zone at an intermediate point thereof below the point of introduction of said second vapor phase;

(e) fractionally distilling said second vapor phase and said second liquid phase, in said frictional distillation zone, to produce a third vapor phase predominating in methane and containing insignificant amounts of ethane and higher molecular weight hydrocarbons and a third liquid phase predominating in ethane and higher molecular weight hydrocarbons and containing insignificant amounts of methane; p1 (f) recovering said third vapor phase as a product; and

(g) recovering said third liquid phase as a product.

4,456,462

CONTROL OF INDIVIDUAL SECTION GLASSWARE FORMING MACHINE

Stanley P. Jones, Tickhill, and Derek Gennard, Maltby, both of England, assignors to Emhart Industries, Inc., Farmington, Conn.

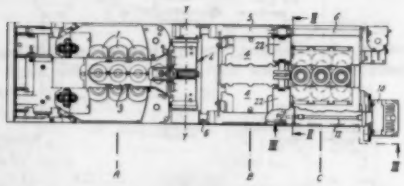
PCT No. PCT/GB82/00054, 371 Date Sep. 30, 1982, 102(e) Date Sep. 30, 1982, PCT Pub. No. WO82/02886, PCT Pub. Date Sep. 2, 1982

PCT Filed Feb. 22, 1982, Ser. No. 433,114

Claims priority, application United Kingdom, Feb. 27, 1981, 8106202

Int. Cl.³ C03B 9/40

U.S. Cl. 65—158 16 Claims



1. An individual section glassware forming machine comprising three operating stations which are, respectively, a blank station including a blank mould for forming a parison, an intermediate station in which reheating of a parison takes place, and a shaping station including a blow mould for finally shaping an article of glassware, and transfer means driven by a motor for carrying a reheated parison from the intermediate station to the shaping station characterised in that said motor is an electric motor and in that the machine also comprises generating means for generating an electrical command signal the magnitude of which varies in accordance with a desired position against time curve for the movement of a reheated parison from the intermediate station to the shaping station, and an electrical servo-mechanism operated by said electrical command signal, said electrical servo-mechanism operatively connected to said motor to control the movement of the transfer means.

4,456,463

AMMONIA STABILIZED HIGH ANALYSIS LIQUID FERTILIZERS

Jerry H. Stoller, Bunkerhill, Tex., assignor to Stoller Enterprises, Inc., Houston, Tex.

Filed Oct. 15, 1982, Ser. No. 434,521

Int. Cl.³ C05C 9/00

U.S. Cl. 71—29 20 Claims

1. In a high analysis, non-ammoniated, liquid fertilizer composition which is the reaction product of urea and phosphoric acid, or a mixture of phosphoric acid and sulfuric acid, and characterized as a clear liquid, which does not salt out at 0° C., has a pH of less than 4 and has an analysis of N, P_2O_5 and K_2O totaling at least 25 weight percent of the fertilizer in the ranges of >0 to 30 wt. % N, 5 to 50 wt. % P_2O_5 and to 12 wt. % K_2O wherein the improvement is the presence of from about 1 to 2.5 weight percent ammonia therein when the weight percent of P_2O_5 is greater than about 30 and from about 1 to 4 weight percent ammonia therein when the weight percent of P_2O_5 is less than about 30 whereby the pH of said liquid fertilizer is stabilized.

4,456,464

PHENOXY- AND PYRIDYLOXY-PHENOXYALKYL PHOSPHINATES AND RELATED SULFUR COMPOUNDS FOR WEED CONTROL

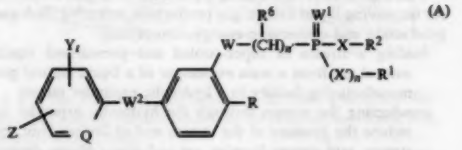
Shy-Fuh Lee, Sunnyvale, and Clive A. Henrick, Palo Alto, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 379,587, May 19, 1982, abandoned, which is a continuation-in-part of Ser. No. 317,622, Nov. 2, 1981, abandoned, and a continuation-in-part of Ser. No. 317,623, Nov. 2, 1981, abandoned. This application Oct. 8, 1982, Ser. No. 433,486

Int. Cl.³ C07F 9/40, 9/32, 9/36; A01N 57/14, 57/22, 57/24

U.S. Cl. 71—87 25 Claims

1. A compound of the formula (A):



(A)

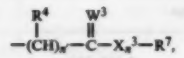
wherein,

R is hydrogen, amino, chloro, cyano or nitro;

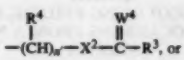
n is 0 or 1; n' is 1, 2 or 3;

R^1 is hydrogen, lower alkyl, lower haloalkyl, phenyl or benzyl, provided that R^1 is not hydrogen when n is 0;

R^2 is selected from group (1), (2) or (3)



(1)



(2)

(3) hydrogen, metal cation, lower alkyl, lower haloalkyl, lower cyanoalkyl, cycloalkyl, cycloalkalkyl, heterocycloalkyl, heterocycloalkalkyl, lower alkenyl, lower haloalkenyl, lower alkynyl, lower haloalkynyl, lower alkoxyalkyl, lower alkylthioalkyl, lower dialkylaminoalkyl, or substituted or unsubstituted aryl;

R^3 is lower alkyl, lower haloalkyl, lower alkenyl, lower haloalkenyl, cycloalkyl, cycloalkalkyl, substituted or unsubstituted aryl or R^3 and R^4 taken together form an alkylene group of 2 to 4 carbon atoms;

each of R^4 and R^6 is, independently, hydrogen, lower alkyl, lower haloalkyl, lower alkenyl, lower alkynyl, lower alkoxy or lower alkylthio;

R^7 is selected from group (3) of R^2;

Q is CH or N;

W is oxygen, sulfur, sulfinyl, sulfonyl or NR^5 in which R^5 is hydrogen or lower alkyl; each of W^1, W^3 and W^4 is, independently, oxygen or sulfur;

W^2 is oxygen, sulfur, sulfinyl, sulfonyl, methylene, carbonyl or NR^5;

each of X, X' and X^2 is, independently, oxygen, sulfur or NR^5;

X^3 is oxygen, sulfur, methylene or NR^5;

each of Y and Z is, independently, hydrogen, lower alkyl, lower haloalkyl, halogen, lower alkoxy, lower haloalkoxy, cyano or nitro; and

t is 1 or 2.

24. A method for the control of weeds which comprises treating a weed or its locus with a herbicidally effective amount of a compound of formula (A) as defined in claim 1.

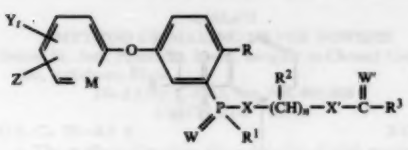
4,456,465

PHENOXY- AND PYRIDYLOXY-PHENYLPHOSPHINATES AND THEIR USE IN WEED CONTROL

Shy-Fuh Lee, Sunnyvale, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Continuation of Ser. No. 309,945, Oct. 9, 1981, abandoned. This application Jan. 10, 1983, Ser. No. 456,913
Int. Cl.³ C07F 9/32; C07D 213/04; A01N 57/14, 57/16
U.S. Cl. 71—87 15 Claims

1. A compound of the formula (A):



(A)

wherein,

n is one, two or three;

t is zero, one or two;

M is CH or N;

R is cyano, nitro, amino or chloro;

R^1 is lower alkyl or phenyl;

R^2 is hydrogen, lower alkyl or substituted or unsubstituted phenyl;

R^3 is lower alkyl, lower alkenyl, lower haloalkyl, lower cycloalkyl, substituted or unsubstituted phenyl, or lower alkoxy; or R^2 and R^3 together form an alkylene group of two to four carbon atoms; or R^2 and R^3 each forms a carbon-carbon bond to adjacent carbon atoms of a benzene ring, provided that n is one, X' is oxygen and W' is oxygen;

each of W and W' is independently selected from oxygen or sulfur;

each of X and X' is independently selected from oxygen, sulfur or amino; and

each of Y and Z is independently selected from hydrogen, lower alkyl, lower alkoxy, lower haloalkyl, halogen, cyano or nitro.

12. A method for the control of weeds which comprises treating said weed or its locus with a herbicidally effective amount of a compound of formula (A) as defined in claim 1.

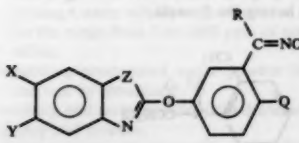
4,456,466

HERBICIDALLY ACTIVE BENZOXAZOLYL ACETOPHENONE OXIME DERIVATIVES

Dennis K. Krass, Canal Fulton, and Sidney B. Richter, Fairlawn, both of Ohio, assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 8, 1982, Ser. No. 440,052
Int. Cl.³ C07D 263/58; E05B 65/46
U.S. Cl. 71—88 6 Claims

1. A compound of the formula:



wherein:

R is hydrogen or C_1 to C_3 alkyl which alkyl may be substituted by halogen, cyano, alkoxy or alkylthio;

R^1 is hydrogen or methyl;

R^2 is hydrogen, C_1 to C_{10} alkyl or an agronomically suitable ionic species;

Q is halogen, nitro, or cyano;

X and Y are the same or different and represent hydrogen, halogen, C_1 to C_4 alkyl, C_1 to C_4 haloalkyl or C_1 to C_4 alkoxy; and

Z is oxygen.

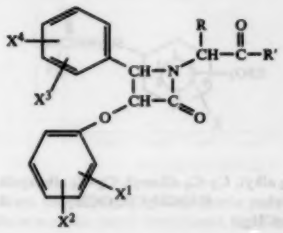
4,456,467

1-METHYLENE CARBONYL DERIVATIVES OF 3-ARYLOXY-4-PHENYL-AZET-2-ONE

Francis J. Freenor, III, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 120,428, Feb. 11, 1980, abandoned. This application Jan. 19, 1981, Ser. No. 225,886
Int. Cl.³ C07D 205/08; A01N 43/44
U.S. Cl. 71—88 10 Claims

1. A compound of the formula



(I)

wherein R is hydrogen or alkyl of 1 to 3 carbon atoms; R' is hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, alkylthio of 1 to 6 carbon atoms, or NR^1R^2 wherein R^1 and R^2 are independently hydrogen or alkyl of 1 to 12 carbon atoms; and X^1, X^2, X^3 and X^4 are independently hydrogen, chloro, bromo, fluoro, iodo, alkyl of 1 to 4 carbon atoms or alkoxy of 1 to 4 carbon atoms.

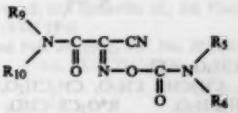
4,456,468

AMINOGLYOXYLONITRILE OXIMIRO CARBAMATES FOR THE PROTECTION OF CROPS AGAINST INJURY BY HERBICIDES

Henry Martin, Allschwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 112,049, Jan. 14, 1980, Pat. No. 4,416,686, which is a continuation of Ser. No. 938,205, Aug. 30, 1978, abandoned. This application Sep. 28, 1982, Ser. No. 425,813
Int. Cl.³ A01N 43/84, 37/52; C07D 223/06; C07C 131/00
U.S. Cl. 71—88 22 Claims

1. A compound of the formula



wherein

R_5 is hydrogen or lower alkyl,

R_6 is hydrogen, lower alkyl, chloroethyl, or phenyl optionally substituted by halogen, lower alkyl, trifluoromethyl or nitro,

R_9 is hydrogen or lower alkyl, and

R_{10} is hydrogen, lower alkyl, allyl or phenyl optionally substituted by halogen, lower alkyl, trifluoromethyl or nitro, or

R_9 and R_{10} taken together with the nitrogen atom to which they are attached form a piperidino, hexahydroazepino or morpholino group.

22. A method for protecting cultivated plants from being

damaged by harmful agricultural chemicals selected from the group consisting of triazines, haloacetanilides and pyridyloxyphenoxypropionates, which method comprises applying to said plants, to parts thereof or to the locus of their growth, an antidotally effective amount of a compound according to claim 1.

4,456,469

PYRIDYL SULFONE HERBICIDES

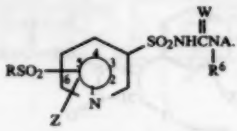
John B. Adams, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 128,176, Apr. 24, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 408,491

Int. Cl.³ C07D *251/46, 251/52;* **A01N** *43/70, 43/40*

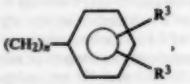
U.S. Cl. 71—93 **23 Claims**

1. A compound of the formula:



wherein

R is C_1–C_6 alkyl, C_3–C_6 alkenyl, C_2–C_4 alkoxyalkyl, C_5–C_6 cycloalkyl, $R^1OCH_2CH_2OCH_2$, $R^1OCH_2CH_2OCH_2CH_2$,



CF_3, CF_3CH_2 or HGLCCF$_2$, HCF_2

R^1 is methyl or ethyl;

R^2 and R_3 are independently H, Cl, OCH_3, F, CH_3, Br, NO_2 or CF_3;

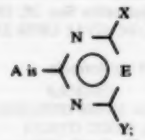
n is 0, 1 or 2;

G is F, Cl, Br or CF_3;

L is F, Cl or H;

Z is H, F, Cl, Br, CH_3, CH_3O or CH_3S;

W is O or S:



X is CH_3, CH_3O or Cl;

Y is CH_3, CH_3CH_2, CH_3O, CH_3CH_2O, $CH_3O(CH_2)_m$, $CH_3OCH_2CH_2O$, $R^4O_2CR^5CHO$, $(CH_3)_2N$, $CH_3(CH_2CN)N$, $NHCH_3$ or NH_2;

E is N;

R^4 is H, CH_3 or CH_3CH_2;

R^5 is H or CH_3;

R^6 is H or CH_3;

m is 1 or 2;

and their agriculturally suitable salts; provided that:

(1) when W=S, then R^6 is H; and

(2) when X=Cl, then E=CH and Y=CH_3, C_2H_5, CH_3O, C_2H_5O, $CH_3O(CH_2)_m$—, NH_2, $NHCH_3$ or $N(CH_3)_2$.

18. A method for controlling the growth of undesired vegetation which comprises applying to the locus to be protected an effective amount of a compound of claim 1.

4,456,470

HERBICIDAL 2-(ALPHA-CHLOROMETHYLSULFONYL) PYRIDINE-1-OXIDES

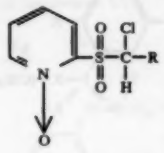
Arthur M. P. Doweyko, Naugatuck; Richard R. Regis, Harwinton, and Allyn R. Bell, Cheshire, all of Conn., assignors to Uniroyal, Inc., New York, N.Y.

Division of Ser. No. 77,431, Sep. 20, 1979, Pat. No. 4,360,677. This application Sep. 13, 1982, Ser. No. 417,006

Int. Cl.³ A01N *43/40*

U.S. Cl. 71—94 **1 Claim**

1. A herbicidal composition comprising a herbicidally effective amount of a compound having the formula



wherein R is selected from the group consisting of 2,5-dimethylphenyl, 2,4-dichlorophenyl, 2,6-dichlorophenyl, 3-fluorophenyl and 2-ethoxyphenyl; and a carrier therefor.

4,456,471

HERBICIDAL N-HALOACETYL-2-METHYL-6-SUBSTITUTED METHOXYMETHYLANILINES

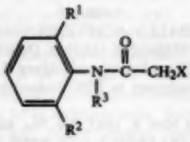
John W. Kobzina, Walnut Creek, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 172,788, Jul. 28, 1980, Pat. No. 4,348,222, which is a division of Ser. No. 53,877, Jul. 2, 1979, Pat. No. 4,244,730. This application Jul. 27, 1982, Ser. No. 402,396

Int. Cl.³ A01N *37/22;* **C07C** *103/38*

U.S. Cl. 71—118 **18 Claims**

1. A compound having the formula:

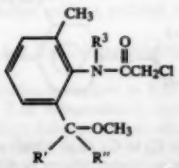


wherein R^1 is methyl;

R^2 is 1,1-dimethoxyethyl;

R^3 is hydrogen, methyl or ethyl; and X is halogen.

4. A compound having the formula:



wherein R^3 is hydrogen or methyl and R' and R" ae independently methyl or ethyl.

4,456,472

SYNERGISTIC HERBICIDAL COMBINATION

Bareld E. Groenwold, Los Altos, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Nov. 29, 1982, Ser. No. 444,959
Int. Cl.³ A01N 37/18
U.S. Cl. 71—118 4 Claims

1. A synergistic herbicidal composition comprising a mixture of herbicidally effective amounts of napropamide and butam, in a weight ratio of between about 2:1 and about 1:2.

4,456,473

METHOD OF MAKING SILVER POWDER

Ernest M. Jost, Plainville, Mass., assignor to Chemet Corporation, Attleboro, Mass.

Filed May 5, 1983, Ser. No. 491,805
Int. Cl.³ B22F 9/00
U.S. Cl. 75—0.5 A 2 Claims

1. The method of making silver powder of high purity having a particle size from 3 to 5 micrometers in diameter which comprises

providing a 1 to 8 molar silver nitrate solution in deionized water containing ammonium hydroxide in which the mole ratio of ammonium hydroxide to silver nitrate is from 2:1 to 3:1,

stirring said solution,

spraying into said solution during stirring a 0.5 to 11 molar solution of hydrazine in deionized water to provide a mole ratio of hydrazine to silver nitrate from 0.25:1 to 0.5:1,

separating precipitated silver powder from the solution by filtration,

washing said silver powder with deionized water, and

drying said powder.

4,456,474

METHOD OF MAKING FINE SILVER POWDER

Ernest M. Jost, Plainville, Mass., assignor to Chemet Corporation, Attleboro, Mass.

Filed May 5, 1983, Ser. No. 491,806
Int. Cl.³ B22F 9/00
U.S. Cl. 75—0.5 A 3 Claims

1. The method of making silver powder of high purity and of controlled particle size within the range 0.6 to 2.5 micrometers in diameter which comprises

providing a reaction mixture comprising a 0.2 to 11 molar hydrazine solution in deionized water containing ammonium hydroxide in which the mole ratio of ammonium hydroxide to hydrazine is in the range from 1:1 to 2:1,

stirring said reaction mixture,

spraying into said reaction mixture during stirring a silver nitrate solution in deionized water in the range of concentration from 1 to 8 molar, the mole ratio of silver nitrate to hydrazine being from 4:1 to 2:1,

introducing into said reaction mixture or into said silver nitrate solution before said spraying step a dopant comprising a water soluble copper salt in an amount equivalent to the range from 0 to 1000 ppm of copper by weight of silver,

separating precipitated metal powder from said reaction mixture by filtration,

washing said metal powder with deionized water, and

drying said powder,

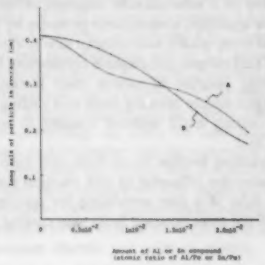
the particle size of said powder being directly proportional within said range to an increase in said concentration of hydrazine and said ratio of ammonium hydroxide to hydrazine and to an increase in the concentration of said silver nitrate solution within said ranges, and being inversely proportional to an increase in the amount of dopant within said range.

4,456,475

PROCESS FOR PREPARING FERROMAGNETIC PARTICLES COMPRISING METALLIC IRON

Shigeo Hirai, Otsu; Toshinobu Sueyoshi, Kyoto, and Masahiro Amemiya, Osaka, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 268,498, May 29, 1981, abandoned.
This application Jul. 25, 1983, Ser. No. 516,432
Claims priority, application Japan, May 30, 1980, 55-73012; May 30, 1980, 55-73014; Jun. 10, 1980, 55-78749
Int. Cl.³ H01F 1/06
U.S. Cl. 75—0.5 AA 6 Claims



1. A process for preparing ferromagnetic particles comprising metallic iron as the major component, the process comprising:

oxidizing $Fe(OH)_2$ in an aqueous medium adjusted to a pH of not less than 11 with gaseous oxygen to produce particles of α-FeOOH, said aqueous medium comprises an alkaline earth metal compound in an amount such that the atomic ratio of the alkaline earth metal in said alkaline earth metal compound to the iron (Fe) component in $Fe(OH)_2$ is from 0.001 to 0.1;

optionally dehydrating the thus obtained α-FeOOH particles under heating to produce particles of α-Fe_2O_3;

coating the α-FeOOH or α-Fe_2O_3 particles with a coating comprising a silicon compound; and

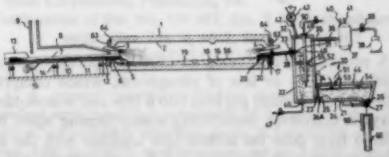
reducing the thus obtained silicon compound coated α-FeOOH or α-Fe_2O_3 particles under heating, whereby ferromagnetic particles of metallic iron having an average long axis particle size with range limits formed by curves A and B in FIG. 1 and having enhanced magnetic characteristics are obtained.

4,456,476

CONTINUOUS STEELMAKING AND CASTING

William L. Sherwood, 553 Granville St., 5th Floor, Vancouver, B.C., Canada (V6C 1Y6)

Filed Feb. 24, 1982, Ser. No. 351,669
Int. Cl.³ C21C 7/00
U.S. Cl. 75—46 23 Claims



1. A process for continuous steelmaking and casting from a rotary furnace, comprising the combination of the following steps:

(a) maintaining a molten metal bath within a rotary furnace

having an axial discharge end opening with the bath surface exposed to substantially atmospheric pressure;

(b) maintaining an enclosed molten metal column external to the furnace having the top surface exposed to a controlled vacuum pressure and confined within an enclosed vacuum chamber having a siphon tube having the exit end connecting into said chamber, and the entry end inserted through the axial furnace discharge opening down through the bath surface and submerged in said bath;

(c) maintaining a molten steel casting pool in a steel casting tundish in direct communication with said column via a submerged channel, with the top surface of said pool at a level higher than said column bottom level extremity and subjected to a substantially constant reference gas pressure, for example, atmospheric pressure by allowing flow of metal from within said column into said casting pool by way of said submerged channel connecting between them;

(d) allowing pouring of molten steel through at lest one submerged nozzle opening from said casting pool, directly into a casting mold without transfer to an intermediate vessel; and

(e) withdrawing molten metal from said bath into said column under the influence of said vacuum pressure via said siphon tube at a rate providing for continual replenishment of the steel pouring from said casting pool for casting.

4,456,477

PRODUCTION OF ULTRA-LOW PHOSPHORUS STEEL

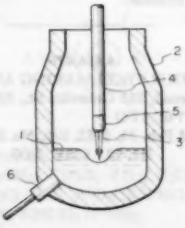
Seiichi Masuda; Tohru Matsuo; Yoshimichi Ohkita, all of Nishinomiya; Takeo Aoki, Kawanishi; Hidemasa Nakajima, Ibaraki; Shozo Okamura, Ibaraki; Takeyuki Hirata, Ibaraki, and Shoji Anezaki, Ibaraki, all of Japan, assignors to Sumitomo Metal Industries, Inc., Osaka, Japan

Filed May 27, 1983, Ser. No. 498,863

Claims priority, application Japan, May 28, 1982, 57-91717

Int. Cl.³ C21C *5/32, 5/34*

U.S. Cl. 75—51 **10 Claims**



1. A process for producing an ultra-low phosphorus steel containing 0.010% or less of phosphorus, which comprises charging a desiliconized pig iron into a top- and bottom-blowing oxygen converter, introducing a slag-forming agent in a powdered form onto the molten iron together with the top-blowing oxygen and introducing a bottom-blowing gas selected from the group consisting of an inert gas, nitrogen gas, oxygen gas, carbon monoxide gas, carbon dioxide gas and mixtures thereof during the oxygen top-blowing or during both the oxygen top-blowing and the subsequent tapping.

4,456,478

METHOD OF AND APPARATUS FOR METALLURGICALLY TREATING MOLTEN METALS

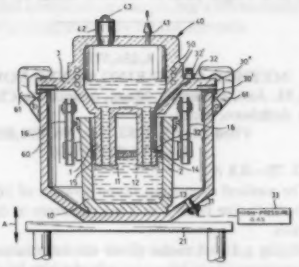
Paul Metz, and Corneille Melan, both of Luxembourg, Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed May 3, 1983, Ser. No. 491,036

Claims priority, application Luxembourg, May 7, 1982, 84133

Int. Cl.³ C21C *7/00*

U.S. Cl. 75—53 **3 Claims**



1. A method of treating molten metal forming a pool covered by a slag layer and an adjoining intermediate layer in an upwardly open transport ladle, comprising the steps of:

(a) spacedly surrounding said ladle with a larger, upwardly open pressure vessel having a rim which leaves the top of said ladle uncovered:

(b) positioning said vessel, with said ladle contained therein, underneath a body which forms a substantially closed treatment chamber and has a tubulation depending from a bottom thereof and communicating with said chamber;

(c) inserting said tubulation from above through said rim into said ladle via the open top thereof to a level below said slag and intermediate layers;

(d) sealingly fitting the rim of said vessel to the underside of a peripheral flange of said body;

(e) introducing a gas under pressure into said vessel and thence through said open top into the interior of said ladle for driving part of the molten metal from said pool into said chamber; and

(f) heating the metal present in said chamber.

4,456,479

VACUUM PURIFICATION OF LIQUID METALS

Ralph Harris, 371 Dulwich, St. Lambert, Quebec H2Z 2P4, Canada, and William G. Davenport, 2036 East 3rd St., Tucson, Ariz. 85719

Continuation-in-part of Ser. No. 367,262, Apr. 12, 1982. This application Mar. 16, 1983, Ser. No. 475,964

Int. Cl.³ C22B *9/04*

U.S. Cl. 75—63 **16 Claims**

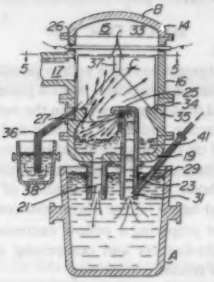
1. A process for removing metallic impurities from a metal having a low vapor pressure, comprising,

selecting an apparatus provided with a receptacle containing a bath of a molten metal having a low vapor pressure and a vacuum chamber and at least one conduit extending from below the surface of the molten metal to a point above the molten metal in the vacuum chamber, to provide for a metal fall under vacuum, condensing means in the upper reaches of the vacuum chamber for condensing rising metallic gases,

continuously injecting a lifting gas into a lower part of said conduit whereby liquid metal is lifted therethrough by the action of the expanding rising gases and discharged in finely divided form by the explosive release of lifting gas to drop in a metal fall onto the surface of the molten metal

in the receptacle and a mixture is formed of said lifting gas and gases evaporating from said molten metal,

subjecting the vacuum chamber to a vacuum effective, in the presence of the lifting gas, to cause a bulk flow of rising gases between the molten metal surface and the condensing means, said vacuum being lower than that which would cause a bulk flow of rising gases in the absence of lifting gas,



continuously condensing the metallic rising gases on the condensing means to prevent reflux of impurities into the molten metal, thereby to increase the speed of removal of metallic impurities,

restoring the pressure to normal, and

recovering the treated metal.

4,456,480

PROCESS FOR PURIFYING METALS BY SEGREGATION

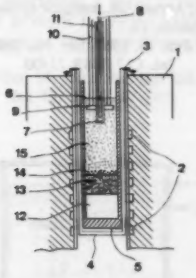
Michel G. Wintenberger, Paris, France, assignor to Pechiney, France

Filed Mar. 28, 1983, Ser. No. 479,492

Claims priority, application France, Mar. 30, 1982, 82 05826

Int. Cl.³ C22B *9/02, 21/06*

U.S. Cl. 75—63 **7 Claims**



1. A process for purifying a volume of liquid metal by fractional crystallization, said process comprising:

(a) cooling a portion of said liquid metal in the upper part of said volume to cause the formation of small metal crystals and a liquid metal containing concentrated impurities;

(b) compacting said small crystals to form a layer of large metal crystals wherein the layer contains virtually no liquid metal;

(c) remelting a portion of the large crystals in said layer to form purified liquid metal in the lower part of said volume;

the rates of said cooling, compacting and remelting being adjusted such that an unbroken layer of large crystals is maintained between the liquid metal containing concentrated impurities in the upper part of said volume and the purified liquid metal in the lower part of said volume such that there is no direct exchange between the purified liquid metal and the liquid metal containing concentrated impurities.

4,456,481

HOT WORKABILITY OF AGE HARDENABLE NICKEL BASE ALLOYS

Robert L. McGinniss, Charlotte, N.C., assignor to Teledyne Industries, Inc., Monroe, N.C.

Continuation-in-part of Ser. No. 300,103, Sep. 8, 1981, Pat. No. 4,376,650. This application Mar. 14, 1983, Ser. No. 475,227

Int. Cl.³ C22B *23/00*

U.S. Cl. 75—82 **7 Claims**

1. In a method for producing an age hardenable nickel base alloy containing 14 to 20 percent chromium, 1.4 to 5.3 percent titanium, 1.2 to 4.7 percent aluminum, 8 to 22 percent cobalt, up to 10 percent molybdenum, up to 3.5 percent tungsten, 0.004 to 0.040 percent boron, 0.02 to 0.15 percent carbon, up to 3.5 percent columbium, up to 0.09 percent zirconium and about 52 to about 62 percent nickel, and in which appropriate raw materials for producing an alloy of said composition are melted, refined, and thereafter cast into an ingot, the improvement which comprises improving the hot workability of the alloy by melting said appropriate raw materials under a vacuum in the presence of lime and forming a desulfurizing lime slag on the surface of the molten raw materials, and thereafter adding magnesium thereto just prior to casting.

4,456,482

FERRITIC STAINLESS STEEL

Thomas J. Nichol, Cheshire, Conn., and Thomas H. McCunn, Lower Burrell, Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 109,373, Jan. 3, 1980, abandoned. This application Jun. 8, 1982, Ser. No. 386,464

Int. Cl.³ C22C *38/18*

U.S. Cl. 75—126 C **9 Claims**

1. A corrosion-resistant tough, weldable ferritic stainless steel consisting essentially of, by weight, from 0.0050% up to 0.08% carbon, from 0.0100% up to 0.06% nitrogen, from 28.5 to 30.5% chromium, from 3.60 to 5.60 molybdenum, up to 2.00% manganese, up to 2.00% nickel, up to 2.00% silicon, up to 0.5% aluminum for deoxidizing the steel, up to 2.00% of elements from the group consisting of titanium, zirconium and columbium, balance essentially iron; said titanium, zirconium and columbium being in accordance with the following equation:

$$\%Ti/6+\%Zr/7+\%Cb/8 \geq \%C+\%N$$

the sum of said carbon plus said nitrogen being in excess of 0.0275%; said steel being characterized by its as-welded crevice corrosion resistance at 50° C. (122° F.).

4,456,483

FERRITIC STAINLESS STEEL

Harry E. Deverell, Natrona Heights, and Thomas H. McCunn, Lower Burrell, both of Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 109,363, Jan. 3, 1980, abandoned. This application Jun. 8, 1982, Ser. No. 386,362

Int. Cl.³ C22C *38/40*

U.S. Cl. 75—128 N **9 Claims**

1. A crevice corrosion-resistant tough, weldable ferritic stainless steel consisting essentially of, by weight, up to 0.08% carbon, up to 0.06% nitrogen, from 28.5 to 30.5% chromium, from 3.60 to 5.60% molybdenum, up to 2.00% manganese, between 2.00 and 5.00% nickel, up to 2.00% silicon, up to 0.5% aluminum for deoxidizing the steel, up to 2.00% of elements from the group consisting of titanium, zirconium and columbium, balance essentially iron; said titanium, zirconium

and columbium being in accordance with the following equation:

$$\%Ti/6+\%Zr/7+\%Cb/8 \geq \%C+N$$

the sum of said carbon plus said nitrogen being in excess of 0.0275%; said steel being characterized by its as-welded crevice corrosion resistance at 50° C. (122° F.).

4,456,484

PROCESS FOR PRODUCING REFRACTORY POWDER

Mary L. Benjamin, Athens; Robert J. Dobbs, Monroeton, and Mary E. Shaffer, Towanda, all of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 365,685, Apr. 5, 1982, Pat. No. 4,397,889. This application Aug. 4, 1983, Ser. No. 520,094

Int. Cl.³ B22F *1/02*

U.S. Cl. 75—252 1 Claim

1. A pressable and sinterable metal carbide grade powder consisting essentially of a uniform mixture of a refractory metal carbide powder, a metal binder powder, and from about 0.5 to about 5 percent by weight of an organic amide having a melting point greater than about 120 degrees centigrade.

4,456,485

PROCESS FOR THE PREPARATION OF EASILY DISPERSIBLE, HIGH COLOR STRENGTH, POWDERED ALKALI BLUE PIGMENTS

Doreswamy R. Iyengar, Holland, Mich.; Joachim Jesse, Weisenheim, Fed. Rep. of Germany, assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 271,438, Jun. 8, 1981, Pat. No. 4,373,962, and Ser. No. 271,594, Jun. 8, 1981, Pat. No. 4,383,865. This application Feb. 15, 1983, Ser. No. 466,759

Int. Cl.³ C09B *48/00*

U.S. Cl. 106—288 Q 37 Claims

1. Process for the preparation of easily dispersible high color strength powdered alkali blue pigments by precipitating the pigment from an aqueous alkaline solution with acids wherein the pigment is either

precipitated in the presence of

(1) primary, secondary or tertiary aliphatic amines carrying at least one C_1-C_{20} alkyl and C_8-C_{20} alkoxy-C_2-C_4 alkyl

(2) N-C_8-C_{20}alkyl amino-C_2-C_8-alkanic acids

(3) diaryl or triaryl amines

(4) acid or neutral esters of phosphoric acid based on fatty alcohol, fatty alcohol alkoxylates, polypropylene glycol, polyethylene glycol or block copolymers based on propylene oxide and ethylene oxide

(5) half ester of sulfuric acid based on C_{10}-C_{20} fatty alcohol, fatty alcohol ethylene oxide adducts or C_5-C_{20} alkyphenol ethylene oxide adducts

(6) C_8-C'alkane or alkene sulfonic acids C_6-C_{20} alkylbenzene sulfonic acids, C_1-C_{20} alkylnaphthalene sulfonic acids or di-C_6-C_{20} alkyl sulfimides

(7) ethylene oxide adducts based on C_1-C_{20} alkyl phenols, C_8-C_{20} alkanols or C_{10}-C_{20} alkyamines wherein the adducts contain at least five ethylene oxide radicals

(8) propylene glycols, or of block copolymers based on alkane diols or alkane polyols with 2 to 8 carbon atoms with propylene oxide and ethylene oxide

or mixtures of these substances at temperatures of 50° to 100° C. or the pigment alone is precipitated at 50° C. to 100° C. and wherein at least one of the substances listed under (1) to (8) is added to the warm pigment suspension while mixing with a pH value in the suspension amounting to 0.8 to 5 at the end of the precipitation and/or to the isolation.

4,456,486

YELLOW NACREOUS PIGMENTS HAVING CALCINED CR OXIDE AND PHOSPHATE LAYER FOR IMPROVED LIGHT-FASTNESS, PROCESS AND USE

Horst Bernhard, Schwarzenberg, Austria, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,741

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1981, 3137808

Int. Cl.³ C09C *1/00*

U.S. Cl. 106—291 11 Claims

1. A nacreous pigment having a yellow powder color and an improved light-fastness comprising a mica platelet coated with a plurality of metal oxide layers, wherein the metal oxide layers comprise the sequence rutile/SnO_2/rutile and the outermost layer is rutile, and on the outermost rutile layer a thin layer of calcined chromium oxide as a protective layer, and in the chromium oxide layer a phosphate content of up to the stoichiometric amount based on the chromium content.

9. A process for preparing a yellow nacreous pigment having improved light-fastness and comprising a mica platelet coated with metal oxides, comprising

(a) coating a mica platelet successively with at least three layers of titanium hydroxide, tin hydroxide and titanium hydroxide, the outermost layer being a titanium hydroxide layer, and optionally washing, drying and calcining the pigment,

(b) coating this pigment with a thin layer of a sparingly soluble chromium (III) compound, which contains phosphate ions of up to the stoichiometric amount based on the chromium content, and then

(c) calcining it at a temperature of about 500° to 1000° C.

4,456,487

METHOD FOR CLEANING AND ANNEALING A THERMOLUMINESCENT RADIATION DETECTOR CRYSTAL

Robert W. Pollock, Aurora, Ill., assignor to Siemens Gammasonics, Inc., Des Plaines, Ill.

Filed Jun. 10, 1982, Ser. No. 386,969

Int. Cl.³ B08B *11/00*

U.S. Cl. 134—31 12 Claims

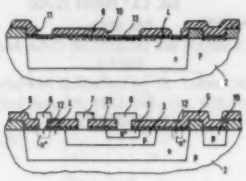
1. A method for processing a thermoluminescent radiation detector crystal which has been irradiated by ionizing radiation, comprising the step of contacting said irradiated crystal prior to read-out thereof with an organic solvent at its boiling point for a time sufficient to clean and anneal said irradiated crystal, said boiling point being approximately equal to the optimum post-radiation annealing temperature of said crystal, said solvent thereby simultaneously cleaning and annealing said crystal.

4,456,488

METHOD OF FABRICATING AN INTEGRATED PLANAR TRANSISTOR

Hans-Jürgen Gahle, Emmendingen, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Mar. 31, 1982, Ser. No. 364,157
Claims priority, application European Pat. Off., Apr. 14, 1981, 81710017.5
Int. Cl.³ H01L 7/44, 21/265
U.S. Cl. 148—1.5 19 Claims



1. In a method for fabricating an integrated planar transistor from a semiconductor body having a planar surface comprising the initial steps of:

introducing first impurities for a collector region into said surface by masked ion implantation and a first diffusion of said first impurities in an oxidizing atmosphere,

the improvement comprising the subsequent steps of:

sequentially introducing into said surface second impurities of a base region and third impurities of an emitter region by sequential masked ion implantations in an oxidizing atmosphere;

covering said surface with a protective insulating layer;

simultaneously diffusing said second impurities in said base region and said third impurities in said emitter region by application of heat;

forming openings in said protective insulating layer in predetermined locations; and

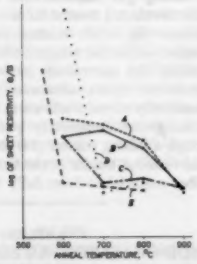
depositing contacts in said openings.

4,456,489

METHOD OF FORMING A SHALLOW AND HIGH CONDUCTIVITY BORON DOPED LAYER IN SILICON

Schyi-Yi Wu, Mesa, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 15, 1982, Ser. No. 434,677
Int. Cl.³ H01L 21/265
U.S. Cl. 148—1.5 11 Claims



1. A method of forming a relatively high conductivity boron doped layer less than approximately 0.3 microns thick in a silicon substrate comprising the steps of:

implanting in the substrate with an energy less than approximately 75 Kev a dose of boron difluoride in the range of approximately $6\times10^{14}/cm^2$ to $5\times10^{15}/cm^2$;

damaging the implanted area of the substrate with an implant an amount approximately equivalent to the damage produced by a dose of silicon approximately $1\times10^{15}/cm^2$ implanted at an energy of approximately 100 Kev; and

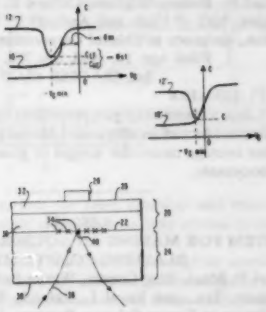
annealing the substrate at a temperature in the range of approximately 675° C. to 900° C.

4,456,490

LASER ANNEALING OF MIS DEVICES BY BACK SURFACE LASER TREATMENT

Subhadra Dutta, Wilkins Township, Allegheny County, and Prosenjit Raichoudhury, Franklin, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 9, 1983, Ser. No. 473,429
Int. Cl.³ H01L 21/263; B23K 27/00
U.S. Cl. 148—1.5 7 Claims



1. A process for fabricating metal-insulator-semiconductor integrated circuits including the steps of: forming an insulator layer on one surface of a doped semiconductor wafer rendering a semiconductor-insulator interface therebetween; forming metallic circuit paths on the top surface of said insulator layer; and

thereafter, annealing said fabricated wafer by passing a laser beam through the semiconductor wafer from the back surface thereof to said semiconductor-insulator interface, said laser beam being of a wavelength which makes the semiconductor wafer substantially transparent and the insulator substantially absorbent to the laser beam to effect localized heating of the insulator at the semiconductor-insulator interface.

4,456,491

METHOD OF HOT-FORMING METALS PRONE TO CRACK DURING ROLLING

Ronald D. Adams, and E. Henry Chia, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 80,368, Oct. 1, 1979, Pat. No. 4,352,697. This application Mar. 9, 1981, Ser. No. 241,788
Int. Cl.³ C22F 1/04
U.S. Cl. 148—2 22 Claims

1. In a method of continuously casting molten aluminum and hot forming said cast metal in substantially its as-cast condition at a hot-forming temperature by a plurality of substantial compressions, the improvement comprising the steps of:

following casting of said metal and prior to said substantial compression of said metal, forming a substantially uniform subgrain structure at least at the surface of said metal by at least one preliminary light compression of said metal wherein said metal is selected from the group consisting of aluminum and aluminum alloys.

4,456,492

MELT EXPLOSIVE COMPOSITION

Roger D. Alexander, Montmorency, and Andrew J. Bates, Ascot Vale, both of Australia, assignors to ICI Australia Limited, Melbourne, Australia

Filed Dec. 6, 1982, Ser. No. 447,136
Claims priority, application Australia, Dec. 23, 1981, PF2073
Int. Cl.³ C06B *45/34*
U.S. Cl. 149—8 30 Claims

1. A melt explosive composition comprising as a first component a melt which assumes a molten form at a temperature in the range from −10° C. to +90° C. and which comprises at least one oxygen-releasing salt and at least one melt soluble fuel material and a second component comprising prills of ammonium nitrate having oil absorbed thereon.

4,456,493

LOW VULNERABILITY GUN PROPELLANT

Michael W. Barnes, Brigham; Clifford E. Kristofferson, North Ogden, both of Utah, and Anthony P. Manzara, Stillwater, Minn., assignors to Thiokol Corporation, Chicago, Ill.

Filed Apr. 11, 1983, Ser. No. 484,001
Int. Cl.³ C06B *45/10*
U.S. Cl. 149—19.4 12 Claims

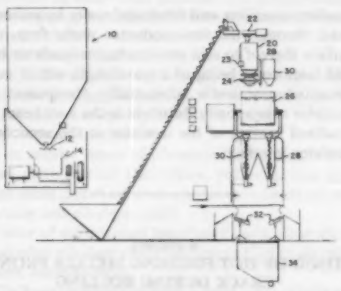
1. A low vulnerability gun propellant binder comprising the reaction product of an alkynediol formal prepolymer having a number average molecular weight of greater than 1000, and a polyisocyanate.

4,456,494

SYSTEM FOR MAKING AN AQUEOUS SLURRY-TYPE BLASTING COMPOSITION

Michel E. Maes, King County, Wash.; Robert L. Shaw, Dallas County, Tex., and Royal L. Reinsch, King County, Wash., assignors to Energy Sciences Partners, Ltd., Seattle, Wash.

Continuation-in-part of Ser. No. 154,381, May 29, 1980. This application Aug. 3, 1982, Ser. No. 404,764
Int. Cl.³ C06B *45/02*
U.S. Cl. 149—21 8 Claims



1. A method for making a homogeneous, aqueous slurry-type blasting composition containing a particulate inorganic nitrate oxidizer and a particulate metal fuel, comprising:

blending a particulate gelling agent together with a finely divided powdered metal to form a dry mixture thereof;

blending 10–20% by weight of the total amount of water to be used in the composition with the particulate inorganic nitrate oxidizer;

adding the dry blend of gelling agent and powdered metal to the damp, particulate, inorganic nitrate oxidizer;

blending the damp inorganic oxidizer and powdered metal/-gelling agent together for a brief period of time; and

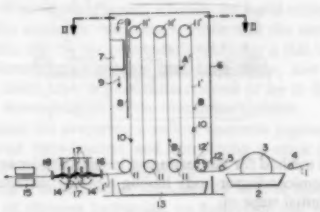
adding the remaining water to the composition while slowly subjecting the mixture to tumbling for a time sufficient to obtain a uniform composition.

4,456,495

METHOD FOR IMPREGNATING REINFORCING FIBER MATERIALS WITH A RESINOUS BINDER MATERIAL

Rolf Doellinger, Fischbachau, and Rudolf Schindler, Neubiberg, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 196,863, Oct. 14, 1980, abandoned. This application Apr. 19, 1982, Ser. No. 369,641
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1979, 2942729
Int. Cl.³ B65H *81/00*
U.S. Cl. 156—166 7 Claims



1. A method for producing fiber compound material made of bands of reinforcing fiber material impregnated with a liquid resinous binder, comprising the following steps:

(a) using as said reinforcing fiber material a fiber material having a meter weight up to about 2400 tex and a diameter of about 5 to 15 microns for each fiber, and using as said liquid resinous binder a warm or hot curing resin hardener system,

(b) advancing a plurality of said bands of reinforcing fiber material in parallel to one another and substantially horizontally over an impregnating roller (3) so that only one surface (A) of each band (1) contacts the impregnating roller for coating said one surface of the bands with an excess quantity of said liquid resinous binder, said excess quantity being in excess of a quantity required for complete impregnation,

(c) advancing said bands for at least 30 seconds over a plurality of rollers (11, 11') forming a calender type roller arrangement in a temperature controlled chamber (6) for sequentially and repeatedly applying pressure alternately to opposite surfaces of a band of reinforcing fiber material, to completely and repeatedly penetrate said bands with said liquid resinous binder by the action of said rollers for eliminating gas bubbles from interstices between fibers while circulating heated air in said temperature controlled chamber (6), while maintaining a temperature in said chamber within the range of about 30° C. to about 150° C.,

(d) guiding the completely penetrated bands outside said chamber (6) from a substantially horizontal advance into a substantially vertical advance, and

(e) moving the completely penetrated advancing bands through a fulling station (14) for adjusting the quantity of liquid resinous binder in the bands relative to the quantity of fiber material to form fully impregnated bands.

4,456,496

METHOD OF MAKING AN ELASTOMERIC FABRIC CONTAINER

Charles A. Suter, Stow, and Raymond J. Namsick, Akron, both of Ohio, assignors to Goodyear Aerospace Corporation, Akron, Ohio

Continuation of Ser. No. 618,980, Oct. 2, 1975, abandoned. This application Mar. 1, 1979, Ser. No. 16,588
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—249 4 Claims

1. A method of making an elastomer coated fabric container

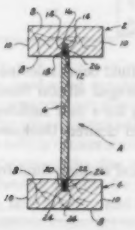
comprising coating a fabric with a curable elastomer, curing the curable elastomer coating on the fabric, cutting a panel from said elastomer coated fabric either before or after the curing step, assembling said panels of cured elastomer coated fabric into a container by placing each edge of the panel in overlapping relationship with another edge, positioning a preformed strip or film of an adhesive composed of an elastomer and a thermosetting resin between the edges in overlapping relationship and pressing said edges under pressure for at least two minutes at a temperature and pressure sufficient to cause a bond to form between each panel.

4,456,497

WOOD I-BEAM AND METHOD OF FABRICATING THE SAME

George F. Eberle, 414 Killearn La., St. Louis, Mo. 63141

Filed Sep. 29, 1982, Ser. No. 428,165
Int. Cl.³ B32B *31/00*
U.S. Cl. 156—257 **14 Claims**



1. An I-beam comprising: a pair of flange pieces made from a lumber material such as wood, each flange piece having a groove that opens out of one of its surfaces, the flange pieces being arranged such that they are spaced apart and such that the groove on the one flange piece is presented opposite to and opens toward the groove on the other flange piece, each groove being tapered such that it is widest in the region of the surface out of which it opens and has side walls which converge generally from that surface to a base; a web interposed between the two flange pieces and being made from lumber such as wood, the web having generally parallel side faces and opposite edges, with the side faces extending all the way to the opposite edges, one of the opposite edges of the web being in the groove of the one flange piece and the other opposite edge being in the groove of the other flange piece, the web at each of its opposite edges having kerfs which divide the web along each of its edges into a pair of legs, the legs having outside faces which in the region of the bases for the kerfs are spaced apart a distance generally equal to the thickness of the web so that the outside faces of the legs are part of the side faces of the web, the pair of legs along each edge further having their outside faces in face-to-face contact with the side walls of the groove in which that edge is located, whereby the legs within each groove converge toward each other; and glue between the side walls of each groove and the outside faces of the legs that are within the groove so as to secure the flange pieces to the web.

4,456,498

MICROWAVE APPLICATOR FOR CONTINUOUS PRESS

Mark T. Churchland, Burnaby, Canada, assignor to MacMillan Bloedel Limited, Vancouver, Canada

Filed Aug. 10, 1982, Ser. No. 406,769
Int. Cl.³ B30B *5/02, 5/04, 15/34*; H05B *6/64*
U.S. Cl. 156—275.5 **23 Claims**

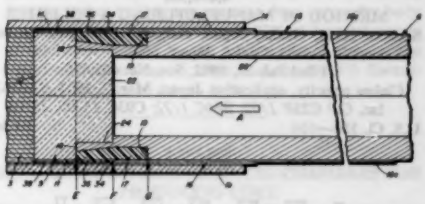
1. An apparatus for the simultaneous application of pressure and microwaves to curable assemblies comprising:

a continuous press including two endless metal press belts forming a nip region, the press belts being disposed to apply pressure to curable assemblies inserted therebetween, and including an inlet and an outlet for the passage of curable assemblies,

a press chamber defined by the two belt surfaces and by two side walls,

means to apply microwaves to the curable assemblies from at least one microwave generator through a waveguide forming an interface with the press chamber located in an opening in at least one of said side walls, said waveguide spanning substantially the entire vertical spacing between said belts

dam means at the interface between the waveguide and the press chamber to provide a solid interface between said curable assembly and said waveguide to withstand the lateral pressure exerted thereon by curable assemblies being pressed, and which effectively permits propagation



of microwaves into the press chamber said microwaves having an electric vector substantially normal to the plane of said press belts,

said dam means being selected from the group consisting of a solid ceramic member and a reinforced member containing spaced metal elements normal to the electric vector of the microwave field,

said waveguide being positioned from the near-edge of the curable assembly at a distance sufficient to permit substantial equalization of fringing electric fields, and

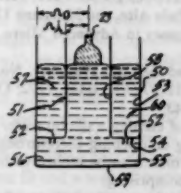
said waveguide including a ¼ wave choke adjacent each moving belt for effectively establishing the point of contact between the waveguide and the press belts at a point (2n+1) (wavelength of the microwave energy being used)/4, from the microwave path entrance to the wave choke, where n is an integer.

4,456,499

DOUBLE CRUCIBLE CZOCHRALSKI CRYSTAL GROWTH METHOD

Wen Lin, Ewing Township, Mercer County, N.J., assignor to AT&T Technologies, Inc., New York, N.Y.

Division of Ser. No. 042,693, May 25, 1979, Pat. No. 4,352,784.
This application Jul. 22, 1982, Ser. No. 400,570
Int. Cl.³ C30B *15/04, 15/12*
U.S. Cl. 156—605 **5 Claims**



1. A process for growing a doped single crystal ingot from a melt contained in a concentrically positioned pair of crucibles, said crucibles at least the top portion of which are spaced from each other being interconnected in a manner which allows the

passage of melt from the outer concentric crucible to flow into the inner crucible as melt material is removed from the inner crucible and wherein melt remains in a reservoir portion of the inner crucible after inner crucible melt flow ceases, including the steps of:

(a) contacting a seed crystal with the surface of the melt in the inner concentric crucible;

(b) pulling the seed crystal from the melt so as to form single crystal growth on the seed crystal;

(c) providing a flow of melt from the outer concentric crucible to the inner crucible through crucible flow interconnection means to continuously replace melt material removed from the inner crucible during crystal growth; and

(d) continuing to pull the crystal from the melt contained in the inner crucible after the flow of melt from the outer crucible to the inner crucible ceases.

4,456,500

METHOD OF MANUFACTURING A POLISHER

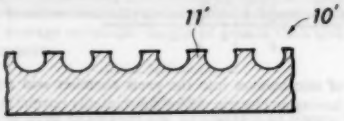
Sachiko Ibata, Osaka, Japan, assignor to Nippon Tenshashi Kabushiki Kaisha, Osaka, Japan

Filed Jul. 28, 1982, Ser. No. 402,675

Claims priority, application Japan, Mar. 2, 1982, 57-33626

Int. Cl.³ C23F 1/02; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 156—634 **5 Claims**



1. A method of making a polishing element comprising the steps of:

depositing a photoresist film on a coarse surface of metal stock;

using a photomask to selectively cover portions of said photoresist film;

removing portions of said photoresist film thereby leaving portions of said metal stock coarse surface uncovered,

etching recesses in said uncovered portions of said metal stock coarse surface by applying an etchant while said metal stock and said etchant are in physical motion relative to each other, thereby forming cutting teeth having teeth tops lying essentially in the plane of said metal stock coarse surface and teeth sides which at least partially define said recess, the interior angle between said teeth top and teeth side being an acute angle;

removing remaining portions of said photoresist film from said metal stock; and,

hardening said coarse surface of said metal stock on which said cutting teeth are formed.

4,456,501

PROCESS FOR DISLOCATION-FREE SLOT ISOLATIONS IN DEVICE FABRICATION

Atiye Bayman, Palo Alto, and Mammen Thomas, San Jose, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Dec. 22, 1983, Ser. No. 564,813

Int. Cl.³ H01L 21/306; B44C 1/22; C03C 15/00, 25/06

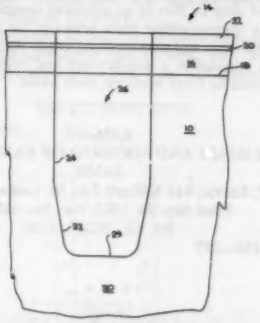
U.S. Cl. 156—643 **6 Claims**

1. A method of etching a silicon wafer masked with a masking layer having an opening therethrough exposing a portion of said wafer which is to be etched to form a depression of a desired depth, comprising:

first, plasma etching said portion under relatively high bias voltage-relatively high energy plasma etching conditions with a plasma which includes chlorine and a shape modifier species to a first depth which is less than said desired depth;

second, plasma etching said depression from said first depth to said desired depth under relatively low bias voltage-relatively low energy plasma etching conditions with a plasma which includes chlorine and is substantially free of said shape modifier species; and

third, contacting a wet chemical etching fluid with said



depression, said fluid being selected to etch away a desired thickness of damaged silicon from said depression, said contacting being for a time sufficient to accomplish etching away of said desired thickness of silicon from said depression; and

rinsing said chemical etching fluid from said depression.

4,456,502

METHOD FOR ADJUSTING THE FORMAT OF CONTINUOUS AQUEOUS FIBRE SUSPENSION DELIVERED BY THE HEAD BOXES OF A PAPER MANUFACTURING MACHINE, AND THE DEVICE FOR CARRYING OUT SAID METHOD

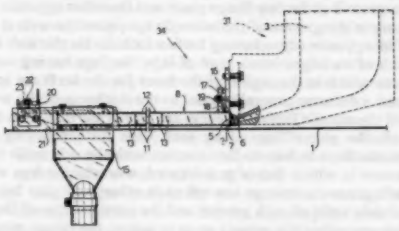
Umberto F. Bollani, Turin, Italy, assignor to Beloit Corporation, Beloit, Wis.

Filed Jul. 26, 1982, Ser. No. 401,739

Claims priority, application Italy, Jul. 31, 1981, 68078 A/81

Int. Cl.³ D21F 1/56

U.S. Cl. 162—133 **8 Claims**



1. The method of controlling the edge of a paper web formed on a traveling foraminous wire from stock issuing from the slice of a headbox comprising the steps of:

separating the marginal edge of a layer of stock as it leaves the slice opening by placing a blade in contact with the slice in the stock flow from the slice opening;

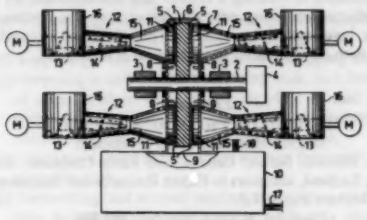
collecting the material of said marginal edge by conveying it into a collector; and

the blade being located in a predetermined position and being adjusted along the emerging width of the layer leaving the slice opening in accordance with the width of the edge to be removed.

4,456,503
APPARATUS FOR MANFACTURING MECHANICAL PULP

Hjalmar S. I. Bystedt, Enebyberg, Sweden, assignor to Sunds Defibrator AB, Stockholm, Sweden

Division of Ser. No. 195,707, Oct. 9, 1980, Pat. No. 4,372,810.
This application Sep. 29, 1982, Ser. No. 428,085
Claims priority, application Sweden, Oct. 10, 1979, 7908411
Int. Cl.³ D21B 1/14
U.S. Cl. 162—261 2 Claims



1. An apparatus for producing mechanical pulp in which chips of lignocellulosic material are ground in the presence of moisture while being forcibly retained against the opposite end faces of a grinding disc which rotates about an axis perpendicular to said opposite end faces of the disc within means defining a pressurized housing having an inlet for the chips, steam inlet means for pressurizing said housing and outlet means for discharging the ground material from said housing, said apparatus being characterized by passage means for advancing said chips into continuous forced contact with one or more grinding areas located on each of said opposite end faces, said passage means comprising a portion tapering in the direction of advancement of the chips and for advancing and compressing said chips in said tapering portion into a substantially steam-tight plug while being advanced therein and an outwardly flared portion for receiving said plug of chips and allowing it to expand therein during the further advancement of the chips into contact with said grinding areas.

4,456,504
REACTOR VESSEL AND PROCESS FOR THERMALLY TREATING A GRANULAR SOLID

Byron G. Spars, Mill Valley; Paul W. Tamm, Oakland, and P. Henrik Wallman, Berkeley, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 145,290, Apr. 30, 1980, Pat. No. 4,337,120. This application Dec. 31, 1981, Ser. No. 336,227
The portion of the term of this patent subsequent to Jun. 29, 1999, has been disclaimed.
Int. Cl.³ C10B 47/24
U.S. Cl. 201—12 7 Claims

1. A reactor vessel for the processing of a body of granular solids containing a diversity of particle sizes in the presence of a countercurrently flowing gas which comprises:

(a) a closed, vertically elongated, generally cylindrical vessel having a diameter of at least one meter;

(b) means for passing a gas upwardly through the vessel at a preselected velocity sufficient to fluidize a first fraction of the granular solids, but insufficient to fluidize a second fraction of said solids;

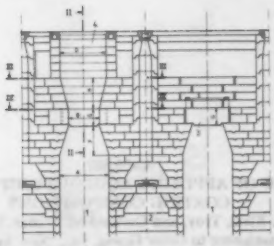
(c) means for introducing the granular solids into the upper portion of the vessel and withdrawing them from the bottom of the vessel, whereby the granular solids pass downward through the vessel as a continuous moving body of granules countercurrent to the gas passing upwards therethrough; and

(d) a plurality of dispersing elements internally disposed within the vessel for substantially limiting gross vertical backmixing of the granular solids and for increasing the residence time of the second fraction of non-fluidized granules, said dispersing elements being so disposed and constructed as to keep the pressure drop across the body of solids between about 80% and 130% of the total weight of the solids divided by the cross-sectional areal of the vessel while allowing no more than about a 5% fluctuation in said pressure drop.

4,456,505
COKING OVEN WITH HORIZONTAL CHAMBERS FOR PRODUCING COKE

Wilhelm Jakobi, Essen, Fed. Rep. of Germany, assignor to Krupp-Koppers GmbH, Essen, Fed. Rep. of Germany

Filed Oct. 8, 1982, Ser. No. 433,808
Claims priority, application Fed. Rep. of Germany, Oct. 31, 1982, 3143248
Int. Cl.³ C10B 25/24, 29/02
U.S. Cl. 202—133 2 Claims



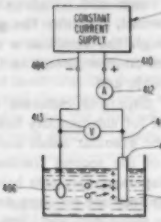
1. In a coking oven with horizontal chambers each provided with a filling hole formed in the oven above the respective chamber for feeding the chambers with coking coal, each chamber having in the region of gas collection a width which is gradually reduced in the upward direction towards said filling opening, a combination comprising a plurality of plates each disposed at the top of the respective chamber, said plates each being formed of single brick format extending normal to the direction of elongation of the respective chamber, each plate being formed with an opening constituting a lower portion of the filling hole and having a rectangular cross-section with a cross-sectional area defined by B×C, wherein B is one side of the rectangle and corresponds to the width of the respective chamber at the apex of the chamber and C is another side of the rectangle, said filling hole having a first cylindrical portion with diameter D and a second portion, said first portion merging into said second portion, said second portion extending upwardly from said opening of the plate over the height H and having a cross-section which is gradually reduced in the direction of the side C and enlarged in the direction of side B over the entire height H upwardly toward said first cylindrical portion up to diameter D.

4,456,506

SUPERCONDUCTING CIRCUIT FABRICATION

Barry F. Stein, Dresher, and Peter L. Young, North Wales, both of Pa., assignors to Sperry Corporation, New York, N.Y.

Filed Jan. 28, 1982, Ser. No. 344,274
Int. Cl.³ C25D 7/12, 11/02
U.S. Cl. 204—15 13 Claims



1. A method of anodizing at least a preselected portion of at least one electrically conducting layer disposed over a substrate comprising:

forming an electrically conducting contact layer over said substrate;

forming an electrically insulating layer over said contact layer;

forming said at least one electrically conducting layer over said insulating layer;

electrically coupling said contact layer to the positive terminal of an anodizing power source;

anodizing said at least one conducting layer to a predetermined thickness.

4,456,507

METHOD OF APPLYING AQUEOUS CHIP RESISTANT COATING COMPOSITIONS

Daniel M. Kivel, Troy, and Gerhard M. Weber, Detroit, both of Mich., assignors to Grow Group, Inc., New York, N.Y.

Division of Ser. No. 275,901, Jun. 22, 1981, abandoned. This application Sep. 14, 1982, Ser. No. 417,857
Int. Cl.³ C25D 13/04
U.S. Cl. 204—181 T 25 Claims

4. A method of coating a substrate comprising the steps of:

(a) electrodepositing an organic coating onto a substrate; and then

(b) depositing a chip resistant coating thereon, and

(c) curing the chip resistant coating; wherein the coating composition is comprised of:

(a') 10–100 percent by weight PBW latex binder selected from the group consisting of:

(i) an ethylene vinyl acetate copolymer;

(ii) a carboxylated ethylene vinyl acetate;

(iii) e poxy functional acrylic resin;

(iv) carboxylated styrene-butadiene resin;

(v) carboxylated acrylic;

(vi) hydroxy functional acrylic;

(vii) self-crosslinking acrylic, and

(viii) carboxylated polyvinyl chloride acrylic, and mixtures thereof, dispersed in the water; and (b') 0–90 PBW filler mixed in with the latex binder so that the total of (a') and (b') equals 90 to 100 PBW.

4,456,508

TREATMENT OF COPPER FOIL

John Torday, Gosforth, and Michael E. Bush, Whitley Bay, both of England, assignors to Torday & Carlisle PLC, North Shields, England

PCT No. PCT/GB82/00066, 371 Date Sep. 23, 1982, 102(e) Date Sep. 23, 1982, PCT Pub. No. WO82/02991, PCT Pub. Date Sep. 2, 1982
PCT Filed Feb. 25, 1982, Ser. No. 425,081
Int. Cl.³ C25D 3/22, 3/56, 5/10, 7/06
U.S. Cl. 204—27 18 Claims

1. A method of treating a copper foil characterized by the step of electrodepositing onto the foil at least one nodular or dendritic layer containing zinc whereby the bond strength of the foil with an associated base material is improved.

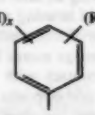
4,456,509

METHOD OF PREPARING METAL DITHIOBENZOATES (PNE-361)

Jacob J. Habeeb, Sarnia, Canada, and Keith Coupland, South Cliffe, England, assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 6, 1982, Ser. No. 395,596
Int. Cl.³ C25C 1/00
U.S. Cl. 204—59 R 6 Claims

1. A method for preparing metal dithiobenzoates having the formula $[\phi C(S)S]_2M$ where M is a transition metal or metal of Groups IA to VA of the Periodic Table and ϕ is the following group:



(I)

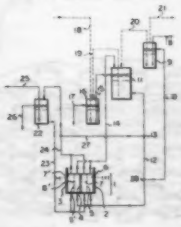
where R is an alkyl of 1 to 18 carbons, n is 0, 1 or 2 and x is 0 or 1, comprising electrolyzing said metal with a substituted dithiobenzoic acid, said acid having substitutuents as in the above group (I).

4,456,510

PROCESS FOR MANUFACTURING CHLORINE DIOXIDE

Katsuyuki Murakami, Maebashi; Kaoru Hirakata, Yoshioka; Fumio Ishizaka, Maebashi; Shinichi Shimoda, Fujimi, and Reiichi Itai, Maebashi, all of Japan, assignors to The Japan Carlit Co., Ltd., Tokyo, Japan

Division of Ser. No. 258,545, Apr. 28, 1981. This application Nov. 22, 1982, Ser. No. 443,189
Claims priority, application Japan, May 13, 1980, 55-63121
Int. Cl.³ C25B 1/26
U.S. Cl. 204—101 14 Claims



1. An electrolytic process for producing chlorine dioxide comprising:

(a) electrolytically producing an anolyte having chlorine

dioxide dissolved therein in an anode compartment of an electrolytic cell,

(b) forwarding said anolyte from said anode compartment to a stripping tank,

(c) supplying a first mixture comprising air and chlorine dioxide obtained from an auxiliary stripping to said stripping tank,

(d) stripping in said stripping tank, a portion of the chlorine dioxide dissolved in said anolyte received from said anode compartment with the air contained in said first mixture to form a second mixture comprising air and chlorine dioxide and a spent anolyte,

(e) forwarding a first portion of said spent anolyte from said stripping tank to said auxiliary stripping tank,

(f) supplying fresh air to said auxiliary stripping tank,

(g) stripping in said auxiliary stripping tank, said first portion of spent anolyte with the air supplied to said auxiliary stripping tank to form said first mixture comprising air and chlorine dioxide and a second spent anolyte,

(h) discharging said second spent anolyte from said auxiliary stripping tank,

(i) forwarding said second mixture comprising air and chlorine dioxide from said stripping tank to a supply tank containing a chlorite solution to thereby form a mixture of air and subtantially pure chlorine dioxide,

(j) forwarding a first portion of the catholyte obtained from the catholyte compartment of said electrolytic cell to a circulation tank,

(k) supplying a diluent to said circulation tank to thereby dilute and control the pH of said first portion of catholyte contained therein,

(l) discharging a first part of said diluted catholyte from said circulation tank,

(m) forwarding a second part of said diluted catholyte to the cathode compartment of said electrolytic cell,

(n) contacting a second portion of said catholyte obtained from the cathode compartment with a second portion of said spent anolyte obtained from the stripping tank to obtain a first anolyte mixture having a pH of from 3 to 8.

(o) contacting said first anolyte mixture with a chlorite solution obtained from said supply tank to form a second anolyte mixture having a chlorite ion concentration of from 10 to 40 g/l.

(p) supplying said second anolyte mixture to the anode compartment of said electrolytic cell, and

(q) recovering subtantially pure chlorine dioxide from said mixture of subtantially pure chlorine dioxide and air obtained from said supply tank.

4,456,511

PHOTOCHEMICAL METHOD FOR GENERATING CHLORINE DIOXIDE GAS

Robert P. Fisher, 4909 NW. 17th Pl., Gainesville, Fla. 32605

Division of Ser. No. 310,459, Oct. 13, 1981. This application Apr. 18, 1983, Ser. No. 485,635

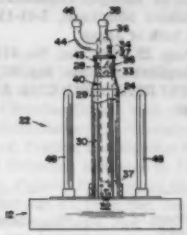
Int. Cl.³ B01J *19/12*

U.S. Cl. 204—157.1 R **3 Claims**

1. A method of generating low concentration of chlorine dioxide gas comprising:

(a) providing an aqueous chlorite solution;

(b) illuminating the aqueous chlorite solution to photochemically oxidize the aqueous chlorite solution to generate an aqueous chlorine dioxide solution and



(c) discharging said aqueous phase of chlorine dioxide into the gaseous phase.

4,456,512

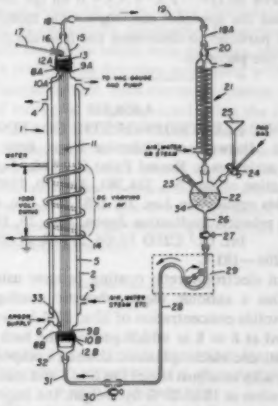
PHOTOCHEMICAL REACTOR AND METHOD

Barrie H. Bieler, Walnut Creek, Calif.; David C. Morgan, Magnolia, Tex., and Robert R. Stringham, Concord, Calif., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 356,679, Mar. 10, 1982, abandoned. This application Jul. 29, 1982, Ser. No. 403,187

Int. Cl.³ B01J *19/12*

U.S. Cl. 204—162 R **20 Claims**



1. A photochemical reaction apparatus comprising the combination of:

(1) an assembly of a pair of tubesheets and a generally parallel array of capillaries transparent to actinic radiation and having two open-ended terminal portions each, one portion passing through and sealingly engaged with one of said tubesheets and the second portion passing through and sealingly engaged with the other of said tubesheets,

(2) a gas, convertible to an actinic radiation-emitting plasma by application of an ionizing potential thereto,

(3) a generally tubular jacket having closeable conduit means for introducing said gas to the interior thereof,

(4) means for developing said ionizing potential, and

(5) header means for introducing a fluid to be irradiated to the interiors of said capillaries;

said assembly being disposed in said jacket in such manner that each end of the jacket is closed by and sealingly engaged with one of said tubesheets and said gas being confined within said jacket at a pressure such that it can be ionized by said potential.

4,456,513

METHOD OF AND APPARATUS FOR MEASURING ELECTROPHORETIC MOBILITY

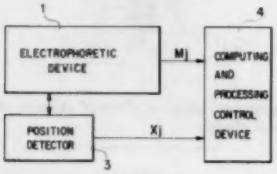
Yoshio Kawai, 3-12-10 Kichijoji-Higashicho, Musashino-shi, Tokyo, and Toshiharu Shirakami, 3-41-11 Narusedai, Machida-shi, Tokyo, both of Japan

Filed Aug. 25, 1982, Ser. No. 411,282

Claims priority, application Japan, Sep. 10, 1981, 56-143016

Int. Cl.³ B01D *57/02;* **C25B** *7/00*

U.S. Cl. 204—180 R **4 Claims**



1. A method of measuring the electrophoretic mobility of particles, comprising measuring the position Xj for each of the particles contained in a test sample, applying an electric field to the test sample to measure the apparent electrophoretic mobility Mj at the position Xj for each of the particles, and substituting the position for the stationary plane at which the flow velocity due to the electroosmotic effect is zero into the theoretical curve $M(x)=-FX^2+AX+B$ on the basis of the position Xj and the apparent electrophoretic mobility Mj for the measured particles to determine the true electrophoretic mobility for the particles.

4,456,514

CATIONIC ELECTROPHORETIC COATING PROCESS

Masayuki Misawa, and Hidetaka Yago, both of Hiratsuka, Japan, assignors to Kansai Paint Co. Ltd., Japan

Continuation of Ser. No. 224,281, Apr. 10, 1980, abandoned. This application Aug. 10, 1982, Ser. No. 406,992

Claims priority, application Japan, Aug. 23, 1978, 53-103159

Int. Cl.³ C25D *13/06, 21/18, 21/20*

U.S. Cl. 204—181 C **1 Claim**

1. In an electrophoretic coating process using a bath prepared from a cationic electrophoretic coating composition having a solids concentration of 10 to 25% by weight and a pH maintained at 6 to 8 in which process the bath is replenished with a cationic electrophoretic coating composition having a low neutrality to adjust the pH to 6 to 8 and maintain the solids concentration at 10 to 25% by weight, the improvement comprising maintaining said pH and said solids concentration without using an ion exchange membrane by using as said replenishing composition a composition selected from the group consisting of a replenishing composition (1) and a replenishing composition (2), composition (1) and a replenishing composition (2), the replenishing composition (1) being prepared by admixing a replenishing coating agent having a lower neutrality than the cationic electrophoretic coating composition, substantially the same solids composition as the cationic electrophoretic coating composition except pigment and a solids concentration of 40 to 80% by weight, with a portion of the cationic electrophoretic coating composition being used for the coating process so that the resulting mixture has a solids concentration of 30 to 45% by weight, the replenishing composition (2) being prepared by admixing the replenishing coating agent described above with a portion of the cationic electrophoretic coating composition being used for the coating process to formulate a replenishing primary premix having a solids content of 25 to less than 30% by weight or more than 45 to 50% by weight and further admixing the premix with a portion of the cationic electrophoretic coating composition being used for the coating process so that the resulting mixture has a solids concentration of 10 to 30% by weight.

4,456,515

METHOD FOR MAKING POLARIZERS COMPRISING A MULTIPLICITY OF PARALLEL ELECTRICALLY CONDUCTIVE STRIPS ON A GLASS CARRIER

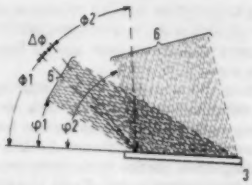
Hans Krueger, Munich, and Hans Rehme, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Apr. 11, 1979, Ser. No. 28,983

Claims priority, application Fed. Rep. of Germany, Apr. 25, 1978, 2818103

Int. Cl.³ G02B *5/30;* **C23C** *15/00*

U.S. Cl. 204—192 P **27 Claims**



1. A maskless method of making a polarizer which comprises a plurality of parallel conductive micro-strips, with a raster spacing of approximately one-tenth of a predetermined wavelength, arranged on a glass carrier, comprising the steps of:

applying an undulating-surfaced conductive layer on a glass carrier by vapor depositing the layer at a first predetermined angle to provide a surface waviness having a period of approximately 50 nm aligned crosswise of the vapor deposition direction; and

bombarding the layer with particles at a second predetermined angle to remove portions of the layer and produce the spaced conductive micro-strips.

4,456,516

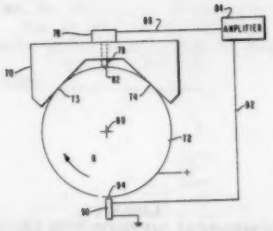
SHAFT ROUNDING APPARATUS

Alfred C. Schaffner, Los Gatos, Calif., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 12, 1983, Ser. No. 493,897

Int. Cl.³ C25F *7/00, 3/14;* **B24B** *33/04, 49/04*

U.S. Cl. 204—217 **8 Claims**



1. Shaft machining apparatus, comprising;

a bracket shaped to slidably contact a shaft at two points, said two points being separated by a preselected arcuate distance on said shaft, said two points being at generally equivalent axial positions on said shaft, said two points defining a chordal line through said shaft;

means for measuring the distance between a preselected point on the surface of said shaft and said chordal line;

means for rotating said shaft relative to said bracket;

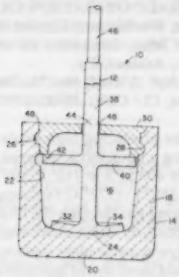
means for creating an electrical signal which is analogous to said distance between said preselected point and said chordal line; and

means for electrochemically removing material from said shaft at said preselected point, said removing means acting in response to said analogous electrical signal and comprising a cathode disposed a predetermined distance from said surface of said shaft and a means for causing a fluid electrolyte to flow between said cathode and said surface of said shaft, said cathode being connected to an electrically negative source, said shaft being connected to an electrically positive source.

4,456,517
METAL SPRING STUB AND CERAMIC BODY ELECTRODE ASSEMBLY

Richard L. Rolf, New Kensington, and Maurice L. Sharp, Avonmore, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Dec. 20, 1982, Ser. No. 451,069
Int. Cl.³ C25C *7/02*; C25B *11/04*; C25D *17/12*
U.S. Cl. 204—286 **6 Claims**



1. An electrode assembly, comprising:

an electrically conductive electrode body having an opening therein;

a metal stub having at least one surface in intimate contact with at least one electrode body surface within the opening;

retainer means to retain said stub within the electrode body opening; and

spring means to enable said stub to expand from application of a temperature differential without damaging said electrode body.

4,456,518
NOBLE METAL-COATED CATHODE

Tilak V. Bommaraju, Grand Island, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

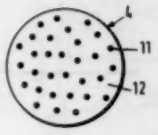
Continuation-in-part of Ser. No. 287,013, Jul. 27, 1981, abandoned, which is a continuation-in-part of Ser. No. 148,320, May 9, 1980, abandoned. This application Dec. 21, 1981, Ser. No. 332,908
Int. Cl.³ C25B *11/00*
U.S. Cl. 204—290 F **6 Claims**

1. A low hydrogen overvoltage alkali metal halate cell cathode comprising a conductive substrate, an intermediate protective layer selected from the group consisting of copper, intermetallic compounds of titanium with noble metals, intermetallic compounds of titanium with transition metals, titanium carbides, titanium borides, titanium nitrides, titanium silicides, titanium phosphides, titanium sulfides, and titanium fluorides, and a porous noble metal coating adhered to and extending over at least a portion of the protective layer, a major portion of said noble metal coating comprising platinum, and a minor portion of said noble metal coating comprising a second noble metal selected from the group consisting of rhodium, palladium, iridium and osmium.

4,456,519
REGENERATABLE, NON-CONSUMABLE ELECTRODE FOR HIGH TEMPERATURE USES

Dieter Zöllner; Christine Zöllner, both of Schwaig bei Nürnberg; Inge Lauterbach-Dammler, Nüremberg; Konrad Koziol, Röthenbach a.d. Pegnitz, and Malcolm F. Pilbrow, Lauf, all of Fed. Rep. of Germany, assignors to C. Conradty Nurnberg GmbH & Co., Pegnitz, Fed. Rep. of Germany

Filed Jul. 17, 1980, Ser. No. 169,851
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1979, 2929346; Jan. 5, 1980, 3000294; Jun. 6, 1980, 3021427
Int. Cl.³ C25B *11/02*; C25C *7/00*
U.S. Cl. 204—290 R **20 Claims**



1. A regeneratable, non-consumable electrode for high temperature uses, in particular for fused salt electrolyses, comprising a number of electrically conductive interconnected electrode elements shaped as tubes, rods or plates, which respectively have a preferential direction coinciding with the direction of the electric current, each electrode element comprising a plurality of inorganic fibers for conducting the electric current, at least one solid and continuous electrochemically active material extending between said fibers so that said fibers are solidly and rigidly embedded in said at least one solid and continuous electrochemically active material, and wherein said fibers are arranged so that the fiber longitudinal orientation coincides essentially with the direction of current conduction within the electrode elements.

4,456,520
POROUS RIGID TITANIUM DISULFIDE ELECTRODES FOR ELECTROCHEMICAL CELLS AND METHOD FOR PREPARING SAME

Gary M. Phillips, Vadnais Heights, and Darrel F. Untereker, Cedar, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Mar. 1, 1982, Ser. No. 353,047
Int. Cl.³ C25B *11/10*; C01B *17/00*; H01M *6/14*
U.S. Cl. 204—291 **14 Claims**

1. A cathode for electrochemical cells comprising a rigid, porous body of predetermined shape, the body consisting only of titanium disulfide and being devoid of binders and other additives, except for incidental impurities, wherein the cathode is made by the method comprising the steps:

providing a unitary porous preformed body of pressed and sintered titanium metal;

contacting substantially the entire surface of the body with sulfur in an amount adequate to stoichiometrically provide titanium disulfide;

heating the titanium body and the sulfur to a temperature of about 600° C. or higher in a protective atmosphere to cause a reaction therebetween, and

maintaining the heating for a time adequate to completely convert the titanium preformed body to titanium disulfide.

4,456,521
THREE LAYER LAMINATE

Frank Solomon, Great Neck, N.Y., and Charles Grun, Matawan, N.J., assignors to Diamond Shamrock Corporation, Dallas, Tex.

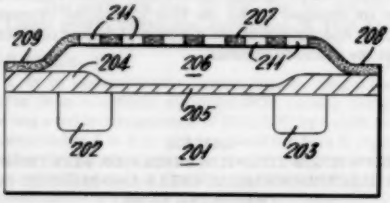
Continuation of Ser. No. 202,577, Oct. 31, 1980, abandoned. This application Apr. 19, 1983, Ser. No. 486,468
Int. Cl.³ C25B 11/03, 11/04
U.S. Cl. 204—292 3 Claims

1. In a laminated oxygen cathode comprising an active layer or sheet laminated on its working surface to a current distributor and on its opposite surface to a polytetrafluoroethylene-containing wetproofing layer, the improvement comprising said active layer or sheet being formed from a fibrillated mixture of unsintered polytetrafluoroethylene and active carbon particles surface area of at least about 1000 m^2/g or more and a particle size of about 1 to about 30 microns.

4,456,522
SUPPORT AND ANCHORING MECHANISM FOR MEMBRANES IN SELECTIVELY RESPONSIVE FIELD EFFECT DEVICES

Gary F. Blackburn, North Salt Lake, Utah, assignor to Critikon, Inc., Tampa, Fla.

Filed Sep. 23, 1981, Ser. No. 304,722
Int. Cl.³ G01N 27/46
U.S. Cl. 204—416 3 Claims



1. A method for fabricating selectively responsive field effect devices whose electrical charcteristics are responsive to a given substance, comprising the steps of:

(a) providing at least one of said devices including an insulated gate region;

(b) covering at least said gate region with a first material;

(c) covering at least said first material with a second material, said second material being coupled to said device at least at predetermined points about the periphery of said gate region;

(d) selectively forming openings through said second material to form a grid pattern;

(e) selectively removing said first material from beneath said second material in said gate region; and

(f) applying membrane material through said grid openings to fill at least the void between said gate region and said second material;

(g) whereby said ambient substances may react with said device through direct exposure to said membrane, whilst said grid protects and anchors said membrane.

4,456,523
PROCESSES FOR PRODUCING HIGH GRADE ASPHALTIC MATERIALS FROM LOW GRADE BITUMINOUS MATERIALS AND PRODUCTS RESULTING THEREFROM

Donald D. Carlos, Louisville; Charles R. Gannon, Ashland, and Robert H. Wombles, Worthington, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

Continuation-in-part of Ser. No. 210,010, Nov. 24, 1980, abandoned. This application Nov. 12, 1981, Ser. No. 320,916
Int. Cl.³ C10C 3/04
U.S. Cl. 208—5 55 Claims

1. A process for producing a high grade asphaltic material, which process comprises oxidizing a bituminous material, having a viscosity of about 30 to 400 saybolt fural seconds at 210° F., at a temperature of about 350° F. to 550° F. by passing an oxidizing gas through the bituminous material in the presence of a catalytic amount of an inorganic carbonate salt or an organic carbonate salt as an oxidation catalyst, whereby said high grade asphaltic material is produced.

4,456,524
PROCESS FOR ENHANCING CATALYTIC RESPONSE OF ASPHALT OXIDATION CATALYST

Robert H. Wombles, Worthington; Charles R. Gannon, Ashland, and Donald D. Carlos, Louisville, all of Ky., assignors to Ashland Oil, Inc., Ashland, Ky.

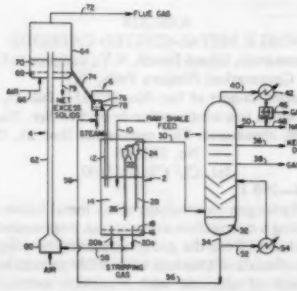
Filed Apr. 2, 1982, Ser. No. 364,749
Int. Cl.³ C10G 27/00, 27/04
U.S. Cl. 208—5 34 Claims

1. In a process for producing high grade asphaltic material comprising oxidizing a bituminous material having a viscosity of about 30 to about 400 SFS at 210° F. (99° C.), at a temperature of from about 350° F. (177° C.) to about 550° F. (288° C.) by passing an oxidizing gas through the bituminous material in the presence of a catalyst, the improvement which comprises using as said catalyst a particulate carbonate salt having an average U.S. standard sieve size of less than about 200 mesh (75 μm).

4,456,525
PROCESS FOR COKING CONTAMINATED PYROLYSIS OIL ON HEAT TRANSFER MATERIAL

Byron G. Spars, Mill Valley; Robert A. Klett, San Francisco, and P. Henrik Wallman, Berkeley, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed May 16, 1983, Ser. No. 495,365
Int. Cl.³ C10G 1/02
U.S. Cl. 208—11 R 8 Claims



1. An improved process for retorting a hydrocarbonaceous solid selected from the group consisting of oil shale and tar sand to recover pyrolysis oil of a lower average molecular weight and containing less contamination which comprises:

(a) pyrolyzing a mixture of particulate raw hydrocarbona-

ceous solid by mixing it with a hot particulate heat transfer material in a retorting vessel and maintaining said mixture at a temperature sufficient to pyrolyze the solid hydrocarbonaceous fraction for a time sufficient to decompose a significant amount of the solid hydrocarbonaceous fraction to hydrocarbon vapors;

(b) passing an inert stripping gas through the mixture of hydrocarbonaceous solids and heat transfer material at a rate sufficient to significantly lower the dew point of the evolved hydrocarbon vapors;

(c) recovering as a pyrolysis product from the raw hydrocarbonaceous solid a contaminated hydrocarbon vapor;

(d) condensing from the contaminated vapor at a temperature of between 550° F. and 680° F. a high-boiling fraction containing concentrated contaminants, said high-boiling fraction being comprised of at least 90% hydrocarbons having a boiling point above 850° F.;

(e) contacting the contaminated high-boiling fraction with at least a portion of the hot heat transfer material in a coking zone prior to said heat transfer material portion being mixed with the raw hydrocarbonaceous solid in step (a) so as to thermally crack the high-boiling fraction and to deposit the contaminants along with coke on the heat transfer material;

(f) recovering a product oil from the coking zone having a lower average molecular weight and having substantially reduced contamination as compared to the high-boiling fraction; and

(g) mixing the coked heat transfer material with the raw hydrocarbonaceous solid.

4,456,526

METHOD FOR MINIMIZING FOULING OF HEAT EXCHANGERS

Richard F. Miller, Humble, and Ting S. L. Go, Houston, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sep. 24, 1982, Ser. No. 423,408
Int. Cl.³ C10G *9/16*
U.S. Cl. 208—48 AA **14 Claims**

1. An antifoulant composition comprising (a) an antifoulant system comprised of 10 to 90 weight percent of at least one N,N-dialkylhydroxlamine wherein the alkyl groups are the same or different and each alkyl group has 2 to 10 carbon atoms, and about 90 to 10 weight percent of at least one tertiary-alkylcatechol having 4 to 20 alkyl carbon atoms and (b) an inert solvent for said antifoulant system selected from kerosene, naphtha, lower alkanes, aromatic compounds and mixtures of these.

8. In a method of inhibiting fouling in petroleum processing equipment comprising injecting into a petroleum or petroleum derivative feed stream to said equipment an amount of antifoulant effective to substantially reduce the rate of fouling, the improvement comprising using as the antifoulant a composition comprised of:

(a) about 10 to 90 parts of at least one N,N-dialkylhydroxylamine wherein the alkyl groups are the same or different and each alkyl group has 2 to 10 carbon atoms, and

(b) about 90 to 10 parts of at least one tertiary alkylcatechol having 4 to 20 alkyl carbon atoms,

per 100 total parts by weight of the compounds in (a) and (b).

4,456,527

HYDROCARBON CONVERSION PROCESS

Waldeen C. Buss, Kensington; Leslie A. Field, Oakland, and Richard C. Robinson, San Rafael, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Continuation-in-part of Ser. No. 436,498, Oct. 20, 1982, abandoned. This application Mar. 21, 1983, Ser. No. 477,111
Int. Cl.³ C10G *45/00*
U.S. Cl. 208—89 **14 Claims**

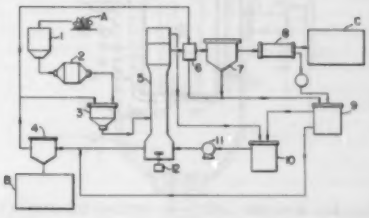
1. A hydrocarbon conversion process comprising reforming a hydrocarbon feed having a sulfur concentration of below 100 ppb over a catalyst comprising a large-pore zeolite containing at least one Group VIII metal to produce aromatics and hydrogen.

4,456,528

PROCESS FOR REMOVING ASH FROM COAL

Hidetoshi Akimoto, Ibaraki; Ryuichi Kaji, Kitaibaraki; Takeo Komuro, Hitachi; Yasushi Muranaka, Katsuta; Hideo Kikuchi, Hitachi; Yukio Hishinuma, Hitachi; Fumito Nakajima, Hitachi, and Hiroshi Terada, Hiroshima, all of Japan, assignors to Hitachi, Ltd. and Babcock-Hitachi Kabushiki Kaisha, both of Tokyo, Japan

Filed Nov. 10, 1981, Ser. No. 320,091
Claims priority, application Japan, Nov. 18, 1980, 55-162839
Int. Cl.³ B07B *13/00*
U.S. Cl. 209—49 **11 Claims**



1. A process for removing ash from coal comprising:

grinding ash containing coal to fine particles;

dispersing the particles in water to form a slurry comprising coal particles, ash particles and water;

introducing the slurry into a separating column;

introducing oil and air together from a single nozzle in the form of air bubbles with all interfaces covered with oil, said bubbles formed by the mixing of air with pressurized oil, into the lower part of the separating column, said bubbles ascending to the upper part of said separating column;

subjecting the slurry to no more than gentle stirring;

attaching the coal particles to surfaces of the ascending bubbles to form a coal containing oil phase on the upper surface of the slurry, said ash particles remaining in the slurry; and

separating the oil phase from the slurry.

4,456,529

FILTER DEVICE FOR DIESEL ENGINES

Lawrence P. Shinaver, Ceres, Calif., assignor to Applied Diesel Engineering, Inc., San Francisco, Calif.

Filed Oct. 21, 1982, Ser. No. 435,721
Int. Cl.³ B01D *27/08*
U.S. Cl. 210—306 **13 Claims**

1. An apparatus for separating low density fluids from high density fluids comprising:

a sediment chamber having an open upper end;

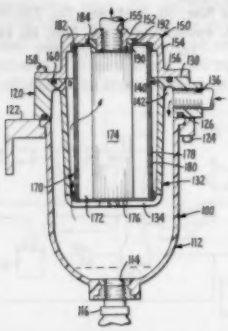
an annular ring, sealingly mounted about the perimeter of said open upper end of said sediment chamber, said annular ring having a fluid inlet port formed therein and with the upper end of said ring being formed with an annular flange projecting radially inwardly such that the upper surface of said ring defines a first planar sealing surface;

an elongated cylindrical baffle member disposed within said sediment chamber, with the upper end of said baffle member being connected to the inner edge of the flange of said annular ring;

cap means having a circular top wall and a generally cylindrical side wall structure extending downwardly from said top wall, with said top wall being generally planar and including opposed upper and lower surfaces, said top

wall further including a fluid outlet port extending therethrough, and with the lower edge of said side wall structure including an annular flange projecting radially outwardly to define a second planar sealing surface, said cap means being mounted to said annular ring with said first and second sealing surfaces being in abutting contact to define a full sealing engagement; and

an elongated cartridge member having a filter element formed therein, with the lower portion of said cartridge member being disposed within said cylindrical baffle



member and with the upper portion of said cartridge member extending upwardly above both said fluid inlet port and the upper edge of said baffle member and terminating adjacent said lower surface of said top wall of said cap means, said filter element being in communication with the fluid outlet port formed in said cap means whereby fluid entering said apparatus through said inlet port is deflected downwardly by said baffle member, and with said fluid being redirected upwardly, enabling it to enter said cartridge member and pass therethrough, exiting said apparatus via said outlet port.

4,456,530

APPARATUS FOR IMPROVING GRAVITY DEHYDRATION IN STRAINER BELT PRESSES

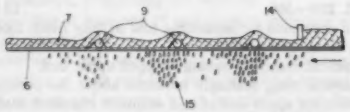
Peter Eustacchio, and Erwin Koren, both of Graz, Austria, assignors to Maschinenfabrik Andritz Aktiengesellschaft, Graz, Austria

Filed Dec. 8, 1982, Ser. No. 447,954

Claims priority, application Austria, Dec. 31, 1981, 5660/81

Int. Cl.³ B01D *33/36*

U.S. Cl. 210—396 **3 Claims**



1. An apparatus for restratifying the filter cake in the strainer zone of strainer belt presses, in particular double strainer sludge dehydrating equipment, comprising at least one monofilament or multifilament cable means (9) tensioned transversely or obliquely to the direction of advance of the strainer across the width of the strainer belt (6) and the filter cake (7), and including cross beam means (8) mounted over the width of the strainer belt, said cross beam means being equipped with spaced, vertical, displaceable bars (11), and said cable means connected to each of said bars (11) in the form of a loop contacting said strainer belt to restratify said filter cake.

4,456,531

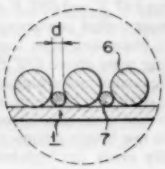
FILTER AND A MANUFACTURING METHOD THEREFOR

Misao Kubota, Nagano; Kazuhiko Terao, Komoro, and Kenji Shimada, Ueda, all of Japan, assignors to Totoku Electric Co., Ltd., Tokyo, Japan

Division of Ser. No. 177,135, Aug. 11, 1980, abandoned. This application Dec. 9, 1981, Ser. No. 328,840

Int. Cl.³ B01D *25/20*

U.S. Cl. 210—409 **17 Claims**



1. A filter obtained by a method which comprises the steps of:

(a) helically winding a filter wire and a spacer wire on a frame body such that the two wires are in contact with each other all along their lengths and such that each turn of the two wires is in contact with the adjacent turns on either side all along the length of the filter, the spacer wire being formed of a material which is different than the material of which the filter wire is formed and the longitudinal slit distance between adjacent turns of the filter wire being made constant by the dimensions of the spacer wire interposed between adjacent turns of the filter wire, then

(b) removing the spacer wire without disturbing the spacing between adjacent turns of the filter wire by use of the different properties of the two wires.

4,456,532

BIOLOGICAL FLOCCULATION OF MINERAL SLIMES

John F. Leslie, Terre Haute, Ind.; Randolph L. Greasham, Mountainside, N.J., and Matthew H. Hulbert, Terre Haute, Ind., assignors to International Minerals & Chemical Corp., Terre Haute, Ind.

Filed May 9, 1983, Ser. No. 492,984

Int. Cl.³ C02F *3/32*; A01G *7/00*; C12R *1/89*

U.S. Cl. 210—602 **14 Claims**

1. A process for the consolidation of mineral slimes resulting from the beneficiation of ores comprising the steps of (a) culturing a microorganism selected from the cyanobacterium group in a body of open water where the cells collect at or near the surface, (b) harvesting the cells after sufficient growth has occurred, (c) delivering the cells to the slimes and mixing well so that the slimes contain a suspension of whole or ruptured cells, (d) subjecting the slimes to an initial dewatering step until maximum pumpable density is reached, and (e) effecting final dewatering of the slimes.

4,456,533

RECOVERY OF BITUMEN FROM BITUMINOUS OIL-IN-WATER EMULSIONS

Walter H. Seitzer, West Chester, Pa., assignor to Suncor, Inc., Toronto, Canada

Continuation of Ser. No. 253,474, Apr. 13, 1981, abandoned. This application May 4, 1983, Ser. No. 491,152

Int. Cl.³ C10G *1/04*

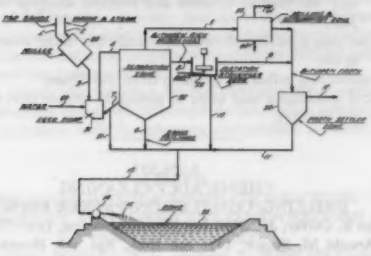
U.S. Cl. 210—708 **5 Claims**

1. A method for separating bitumen from a bituminous oil-in-water emulsion froth comprising:

(a) milling at a temperature between about 10° and about 50° C. with a ball mill, roller mill or equivalent milling device,

a bituminous oil-in-water emulsion froth from a tar sands extraction process containing from about 12 to about 26 wt. % bitumen to impart a crushing action on said emulsion froth and effect coalescence of bitumen;

(b) allowing a bitumen-rich liquid fraction to rise to the surface of the milled emulsion; and



(c) separating said bitumen-rich fraction, wherein the separated bitumen-rich fraction contains a smaller amount of minerals relative to the amount of minerals in the starting oil-in-water emulsion.

4,456,534

WATER CLARIFICATION

Jean-Pierre Lambert, Strasbourg, and Michel L'Huillier, Mundolsheim, both of France, assignors to Polysar International S.A., Switzerland

Filed Jul. 20, 1982, Ser. No. 400,104

Claims priority, application France, Aug. 27, 1981, 81 16371

Int. Cl.³ C02F *1/54*

U.S. Cl. 210—725 **11 Claims**

1. An improved process for clarifying a waste water stream containing therein up to about 1.5 percent by weight of waste synthetic polymeric material in latex form by the use of polymeric flocculants, characterized in that the improvement comprises; the following sequential steps:

(i) feeding said waste water stream to a container equipped with means for agitation,

(ii) maintaing said waste water in said container in an agitated condition for a time of from at least about 3 minutes up to about 3 hours while adding to said container an aqueous stream of calcium chloride sufficient to provide a concentration of from about 200 to about 3000 ppm based on the total water in said container and a liquid or aqueous stream of a cationic flocculant selected from the class consisting of quaternary nitrogen atom containing poly(alkylenepolyamine) and poly(ethyleneimine) flocculants sufficient to provide a concentration of said cationic flocculant of from about 10 to about 50 ppm based on the total water in said container,

(iii) adding to said waste water sufficient of an aqueous stream of calcium, potassium or sodium hydroxide to adjust the pH to from about 9 to about 10,

(iv) adding to said waste water an aqueous stream of an anionic polymeric flocculant generally characterized as a high molecular weight acrylamide-acrylic acid resin of medium anionic functionality sufficient to provide a concentration of said anionic flocculant of from about 2 to about 10 ppm in said waste water, and

(v) passing said waste water stream to separation means to separate therefrom the resulting aggregated polymeric material and to provide an essentially clear waste water stream.

4,456,535

PROCESS FOR THE REMOVAL OF UREA, AMMONIA, AND CARBON DIOXIDE FROM DILUTE AQUEOUS SOLUTIONS

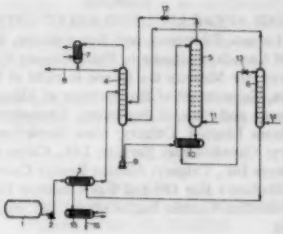
Jan Zuidam, Schimmert; Petrus J. M. van Nassau, Munstergeleen; Pierre G. M. B. Bruls, and Kees Jonckers, both of Born, all of Netherlands, assignors to Unie van Kunstmestfabrieken, B.V., Utrecht, Netherlands

Filed Nov. 30, 1981, Ser. No. 325,922

Claims priority, application Netherlands, Nov. 28, 1980, 8006477

Int. Cl.³ B01D *3/26*; C02F *1/20*

U.S. Cl. 210—750 **4 Claims**



1. In a process for the removal of urea, ammonia, and carbon dioxide from a dilute aqueous solution thereof by hydrolyzing said urea and thereafter desorbing ammonia and carbon dioxide, comprising the steps of:

introducing said dilute aqueous solution into a pre-desorption zone wherein a portion of said ammonia and carbon dioxide is removed therefrom to form a pre-desorption zone off gas containing ammonia, carbon dioxide and water vapor, and a pre-desorption zone liquid stream comprised of a dilute aqueous solution of urea, ammonia, and carbon dioxide;

introducing said pre-desorption zone liquid stream into a reaction column wherein it is contacted with steam introduced into the bottom of said reaction column, while maintaining said reaction column under pressure;

removing from said reaction column a reaction column of gas comprised of a gas mixture containing ammonia, carbon dioxide and water vapor, and a reaction column liquid stream comprised of a substantially urea-free aqueous solution of ammonia and carbon dioxide;

introducing said reaction column liquid stream into a post-desorption zone wherein ammonia and carbon dioxide are removed therefrom to form a post-desorption zone off gas and a residual post-desorption zone liquid stream;

introducing said reaction column off gas and said post-desorption zone off gas into said pre-desorption zone; and

condensing said pre-desorption zone off gas to form a dilute aqueous solution of ammonia and carbon dioxide, at least a portion of which is thereafter used in a process for the preparation of urea;

the improvement comprising:

lowering the ammonia content of said dilute aqueous solution in said pre-desorption zone, at a pressure of between about 1 to and 5 bar, to about 3% by weight or less;

introducing steam having a pressure of between about 15 and 42 bar into said reaction column, and causing the said pre-desorption zone liquid stream to flow downward in said reaction column countercurrent to said steam while maintaining said reaction column at a pressure of between about 10 and 30 bar, and at a top column temperature of between about 170° and 220° C. and a bottom column temperature of between about 180° and 230° C., while maintaining the residence time of said dilute aqueous solution in the reaction column in the range of between about 25 and 95 minutes;

removing said reaction column off-gas from the top of said reaction column and removing said reaction column liquid stream from the bottom of said reaction column;

introducing said reaction column off gas into said pre-desorption zone at a point in such zone between the respective points of supply of said dilute aqueous solution and said post-desorption zone off gas to such zone;

maintaining in said post-desorption zone a pressure of between about 1 and 5 bar; and

discharging from said post-desorption zone a post-desorption liquid-stream having a urea content and an ammonia content of at most 10 ppm each.

4,456,536

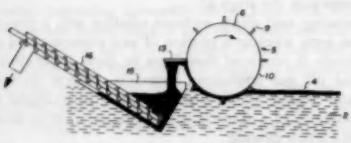
SKIMMER APPARATUS FOR RECOVERING BITUMEN

Gordon Lorenz, Edmonton, and Ken Gehring, Sherwood Park, both of Canada, assignors to Petro-Canada Exploration Inc., Calgary; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources, Edmonton; PanCanadian Petroleum Limited, Calgary; Esso Resources Canada Ltd., Calgary; Canada-Cities Service, Ltd., Calgary; Gulf Canada Resources Inc., Calgary; Alberta Energy Company Ltd., Calgary; Hudson's Bay Oil and Gas Company Limited, Calgary and Petrofina Canada Inc., Calgary, all of, Canada, a part interest

Continuation of Ser. No. 116,818, Jan. 29, 1980, abandoned. This application Jul. 10, 1981, Ser. No. 282,213

Int. Cl.³ E02B *15/04*

U.S. Cl. 210—776 **2 Claims**



1. A skimming apparatus for collecting a cohesive bitumen blanket floating on a body of water, said blanket having a lowermost portion which is stiffer than its uppermost portion due to cooling by the water, said apparatus comprising:

buoyant means for floating said apparatus on the water;

a drum assembly carried by the buoyant means and comprising a horizontally disposed drum arranged to be partly submerged in the water when operative and to rotate in a direction such that its frontal edge rotates downwardly into the water, said drum having a plurality of spaced apart outwardly protruding rigid prongs distributed over substantially its entire curved surface and extending from said surface, said prongs being of sufficient length and arranged to penetrate through the uppermost portion and grip the lowermost portion of the nearest part of the blanket to thereby pull that part into submerged adhesive engagement with the lower surface of the drum when the drum is rotating;

means, carried by the buoyant means, for removing bitumen from the drum after it has emerged from the water;

a receptacle for collecting the removed bitumen; and

means for rotating the drum.

2. A process for collecting part or all of a cohesive bitumen blanket floating on a body of water with a skimming apparatus, said apparatus comprising a rotatable drum having outwardly protruding prongs distributed over its curved surface, said blanket having a lowermost portion which is stiffer than its uppermost portion due to cooling by the water, the drum of said apparatus being partly submerged in the water and in contact with the blanket by buoyant means for floating said apparatus on the water, said process comprising:

rotating the drum in a direction such that its frontal edge rotates downwardly into said bitumen blanket;

gripping the nearest part of the blanket by penetrating it with the prongs of the rotating partly submerged drum, to a sufficient depth so that said prongs grip the lowermost portion, and pulling said nearest part beneath the surface of the water into adhesive contact with the curved outer surface of the submerged portion of the drum, said rotation being sufficiently slow whereby the blanket does not tear but instead follows and remains integral with said part;

carrying adhering bitumen upwardly out of the water on the drum;

recovering adhering bitumen from the drum;

and continuing said steps to gradually collect part or all of the blanket.

4,456,537

CHEMICALLY CLEANING DRILLING/COMPLETION/PACKER BRINES

John E. Oliver, Jr., 3752 Del Monte, Houston, Tex. 77019, and Arnold M. Singer, 1516 Sul Ross, Apt. #3, Houston, Tex. 77006

Filed Oct. 13, 1981, Ser. No. 310,653

Int. Cl.³ E21B *43/00*; C09K *7/02*

U.S. Cl. 252—8.55 R **11 Claims**

1. A process to produce a solids-free aqueous well fluid of high density type having one or more of the sodium, calcium or zinc salts with chloride and bromide, and mixtures thereof, the steps comprising:

(a) introducing in small effective amounts an aliphatic alcohol with between 5 and 8 carbon atoms and a surface active chemical aid into the fluid; and

(b) separating the agglomerated solids from the fluid before introduction into a wellbore in a solids free state, wherein the surface active chemical aid includes a surfactant having a molecular weight in the range of from about 150 to about 500 with predominant hydrophobic characteristics and the surfactant is selected from a group consisting of aliphatic amines, amides and aliphatic amine oxides with the amine and amide and amine oxides constituents having an alkyl group with between 8 and 18 carbon atoms.

4,456,538

PROCESS FOR PREPARING MOLYBDENUM-CONTAINING COMPOSITIONS USEFUL FOR IMPROVED FUEL ECONOMY OF INTERNAL COMBUSTION ENGINES

David E. Ripple, Kirtland, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

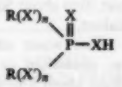
Continuation of Ser. No. 117,891, Feb. 1, 1980, abandoned. This application Nov. 20, 1981, Ser. No. 323,226

Int. Cl.³ C10M *1/48*

U.S. Cl. 252—32.7 E **53 Claims**

1. A process for preparing a composition which comprises reacting:

(a) A phosphorus-containing acid represented by the formula:



wherein each X and X' is independently oxygen or sulfur, each n is zero or one, and each R is independently the same or a different hydrocarbon-based radical;

(b) at least one hexavalent molybdenum oxide compound, and

(c) hydrogen sulfide, in the presence of (d) a polar solvent at a temperature of from about 0° C. up to about 150° C. wherein the ratio of reactants of (a):(b):(c) is from about 0.5 up to about 4 moles of (a): one mole of molybdenum in (b): at least 0.5 mole of H_2S and (d) is present in at least

one minimum amount necessary for the reaction of (a), (b) and (c) to proceed; with the proviso that a reaction mixture of (a) and (b) is first prepared before reaction with hydrogen sulfide (c).

22. A composition prepared according to the process of claim 1.

30. A lubricant composition comprising a major amount of an oil of lubricating viscosity and an amount sufficient to provide improved oxidation stability, antiwear, extreme pressure or friction reducing properties up to about 30% by weight of at least one composition of claim 22.

46. A method for reducing the fuel consumption of an internal combustion engine which comprises lubricating said engine during operation with the lubricant composition of claim 30.

4,456,539

TRIAZOLE-DITHIOPHOSPHATE REACTION PRODUCT AND LUBRICANT COMPOSITIONS CONTAINING SAME

Joosup Shim, Wenonah, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Jul. 29, 1982, Ser. No. 402,877
Int. Cl.³ C10M *1/48*
U.S. Cl. 252—46.7 **27 Claims**

1. A product of reaction made by reacting, at a temperature of from about 70° C. to about 150° C., an alkylbenzotriazole with an organodithiophosphate salt, the reactants being used in quantities such that there are present in the reaction mixture equimolar amounts thereof or amounts in which one is in excess of the other.

12. A lubricant composition comprising a major proportion of a lubricating oil or grease thereof and a minor antioxidant amount of a product of reaction made by reacting, at a temperatuare of from about 70° C. to about 150° C., an alkylbenzotriazole with an organodithiophosphate salt, the reactants being used in quantities such that there are present in the reaction mixture equimolar amounts thereof or amounts in which one is in excess of the other.

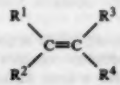
4,456,540

PROCESS OF SULFURIZING TRIGLYCERIDE AND AN OLEFIN

Alexander D. Recchuite, Boothwyn, Pa., assignor to Sun Tech, Inc., Philadelphia, Pa.

Continuation of Ser. No. 49,864, Jun. 18, 1979, Pat. No. 4,321,153, which is a continuation of Ser. No. 220,399, Jan. 24, 1972, which is a continuation-in-part of Ser. No. 135,466, Apr. 19, 1971, abandoned, which is a continuation-in-part of Ser. No. 116,985, Feb. 19, 1971, Pat. No. 3,825,495. This application Nov. 9, 1981, Ser. No. 319,528
Int. Cl.³ C10M *1/38, 3/32*
U.S. Cl. 252—48.6 **7 Claims**

1. A process for making a sulfurized composition comprising blending together from 50 to 90 parts by volume of a triglyceride wherein the fatty acid moieties of said triglyceride contains principally from 9 to 22 carbon atoms and at least about 45 mole percent of the fatty acid moieties present in said triglyceride contain one ethylenically unsaturated carbon-carbon double bond and wherein said fatty acid moieties are hydrocarbons except for the carboxyl group of said fatty acid moieties, with from 50 to 10 parts by volume of a hydrocarbon containing from 2 to about 24 carbon atoms and having the structure



wherein R^1, R^2 and R^3 are either hydrogen or alkyl and R^4 is either hydrogen, alkyl, aryl, cycloalkyl or alkaryl, and 2% to 20% of fatty acids, adding from 7.5 to 25 wt.% as based on said blend of sulfur, heating the blend at from about 330° F. to about 445° F. for from 20 minutes to 10 hours, followed by blowing with a gas to remove H_2S.

4,456,541

ANTIOXIDANT DIAMINE

William E. Wright, Farmington, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 24, 1981, Ser. No. 257,476
Int. Cl.³ C10L *1/22;* C10M *1/32*
U.S. Cl. 252—50 **18 Claims**

1. Organic material normally susceptible to gradual degradation in the presence of oxygen during use over an extended period and of the type in which the art recognizes the need for antioxidant protection and to which an antioxidant of some type is customarily added to obtain an extended service life, containing an antioxidant amount of an aromatic diamine wherein the amino groups are unsubstituted except for hydrogen.

3. A composition of claim 1 wherein said organic material is selected from the group consisting of lubricating oils and liquid hydrocarbon fuels.

4,456,542

METHOD FOR IMPARTING HYDROPHOBIC PROPERTIES TO FIBERS

Wolfgang Wagner, Tokyo, Japan; Matthias Scherer, Emmerting, Fed. Rep. of Germany; Karl-Heinrich Wegehaupt, and Volker Frey, both of Burghausen, Fed. Rep. of Germany, assignors to Wacker Chemie GmbH, Munich, Fed. Rep. of Germany

Continuation of Ser. No. 295,889, Aug. 24, 1981, abandoned. This application Feb. 25, 1983, Ser. No. 469,850
Claims priority, application Fed. Rep. of Germany, Oct. 29, 1980, 3040758
Int. Cl.³ D06M *15/66*
U.S. Cl. 252—8.6 **3 Claims**

1. A method of treating fibers with an organopolysiloxane to impart hydrophobic properties thereto which comprises applying to the fibers at a temperature of from 100° to 170° C. a composition consisting essentially of an organopolysiloxane having units of the formula

$$R_nH_mSiO_{4-m-n/2}$$

Where R is selected from the group consisting of alkyl and aryl radicals having from 1 to 6 carbon atoms, n is 0, 1, 2 or 3, with an average of from 0.9 to 1.8, m is 0 or 1, with an average of from 0.1 to 1.0, in which the only reactive group on the organopolysiloxane is Si-bonded hydrogen atoms and at least 50 gram atoms of Si-bonded hydrogen are present per gram molecule of groups which are capable of reacting with the Si-bonded hydrogen, a platinum catalyst and a compound which inhibits the platinum catalyst and is volatile under the conditions at which the organopolysiloxane containing the Si-bonded hydrogen atoms is deposited on the fiber.

4,456,543

BISBIGUANIDE BASED ANTIBACTERIAL CLEANSING PRODUCTS

James W. Owens, Memphis, Tenn., assignor to The Buckeye Cellulose Corporation, Cincinnati, Ohio

Filed Jun. 17, 1982, Ser. No. 389,196
Int. Cl.³ C11D *1/50, 3/48*
U.S. Cl. 252—106 **11 Claims**

1. An antibacterial cleansing product comprising:

(a) from about 0.001% to about 10% of a salt of chlorhexidine which is soluble in said product;

(b) from about 0.05% to about 50% of a surfactant having the following general chemical structure:

$$H(CH_2)_xO(C_3H_6O)_a(C_2H_4O)_bH$$

wherein x is a number from about 1 to about 10, a is a

number such that the average molecular weight of the polyoxypropylene portion is from about 1,000 to about 1,500, and b is a number such that the average molecular weight of the polyoxyethylene portion is from about 40% to about 75% of the average molecular weight of said surfactant; and

(c) water.

4,456,544

ENZYME-CONTAINING DETERGENT COMPOSITION FOR PRESTERILIZATION TREATMENT OF MEDICAL INSTRUMENTS AND EQUIPMENT

Ljudmila M. Lupova; Lidia G. Fedorova; Renata N. Grebeshova; Zinaida P. Aleshina; Alexandr G. Anton; Alexandr L. Belinsky, and Margarita I. Alexeeva, all of Moscow, U.S.S.R., assignors to Vsesojuzny Nauchno-Issledovatelsky Biotechnichesky Institut, Moscow, U.S.S.R.

Filed Aug. 5, 1983, Ser. No. 520,813

Int. Cl.³ C11D *1/94, 7/42, 17/00*

U.S. Cl. 252—174.12 **3 Claims**

1. An enzyme-containing detergent composition for presterilization treatment of medical instruments and equipment consisting of the following components, percent by weight:

anionic surfactants: 4.0–6.0

sodium phosphate: 30.0–35.0

sodium silicate: 20.0–25.0

sodium carbonate: 19.0–22.0

soap comprising sodium salts of fatty acids: 2.0–4.0

enzymatic preparation: 0.5–2.0

sodium sulphate: the balance,

the enzymatic preparation having the following composition, percent by weight:

alkaline protease: 30–60

neutral protease: 27–45

elastase: 0.01–5.00

collagenase: 0.001–4.00

leucinaminopeptidase: 0.0001–0.011

carboxypeptidase: 0.04–0.15

fibrinolytic enzyme: 0.002–1,500

lipase: 0.5–2.0

amylase: the balance.

4,456,545

DICHROITIC ANTHRAQUINONE DYESTUFFS USEFUL IN LIQUID CRYSTALLINE DIELECTRICS AND ELECTRO-OPTICAL INDICATOR ELEMENTS

Georg Weber, Erzhausen; Rudolf Eidenschink, Dieburg, and Dietrich Erdmann, Darmstadt, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

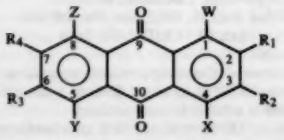
Filed Oct. 23, 1981, Ser. No. 314,304

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040102

Int. Cl.³ C02F *1/13*; C09K *3/34*; C09B *1/00*

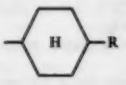
U.S. Cl. 252—299.1 **18 Claims**

1. A dichroitic dyestuff of the formula

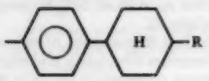


(I)

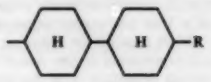
wherein W, X, Y and Z each is hydrogen, NH_2, OH, $NHCH_3$ or NHC_2H_5, provided that not more than 3 of these are the same, and one or two of R_1, R_2, R_3 and R_4 are a group of the formulae (IIa), (IIb), or (IIc)



(IIa)



(IIb)



(IIc)

and the others are hydrogen, R being alkyl of 1–12 carbon atoms.

4,456,546

PROCESS AND REACTOR FOR THE PREPARATION OF SYNTHESIS GAS

Maarten J. Van der Burgt, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 277,358, Jun. 25, 1981, abandoned. This application Aug. 1, 1983, Ser. No. 519,354

Claims priority, application Netherlands, Sep. 2, 1980, 8004971

Int. Cl.³ C01B *3/02*

U.S. Cl. 252—373 **6 Claims**

1. A process for the preparation of synthesis gas by partially combusting finely divided carbon-containing fuel with oxygen-containing gas in a generally elongated vertical reactor, comprising:

inflowing the oxygen-containing gas into the reactor adjacent the bottom along the vertical axis of said reactor;

feeding the fuel to the reactor from a point located inside the reactor on the vertical axis of said reactor, and downstream of the point of the gas inflow, said fuel entering the reactor along a direction at an angle of 90° (±20°) to the reactor vertical axis;

maintaining sufficient gas flow to suspend the fuel in inflowing gas while partially combusting said fuel, and removing the synthesis gas from the top of the reactor.

4,456,547

CATALYST PREPARED FROM ORGANOMAGNESIUM COMPOUND, ORGANIC HYDROXYL-CONTAINING COMPOUND, REDUCING HALIDE SOURCE AND COMPLEX FORMED FROM ADMIXTURE OF A TRANSITION METAL COMPOUND AND AN ORGANOZINC COMPOUND

Ricardo Fuentes, Jr., 12513 Parkciel Dr., Baton Rouge, La. 70816

Filed Oct. 21, 1982, Ser. No. 435,786

Int. Cl.³ C08F *4/62, 4/64, 4/68*

U.S. Cl. 502—117 **4 Claims**

1. A catalytic product resulting from admixing in an inert hydrocarbon diluent and in an atmosphere which excludes moisture and oxygen

(A) at least one hydrocarbon soluble organomagnesium material;

(B) at least one organic alcoholic hydroxyl-containing material;

(C) at least one reducing halide source; and

(D) the reaction product or complex formed by mixing at a temperature and for a time sufficient to cause a color change

(1) at least one transition metal (Tm) compound having at least one hydrocarbyloxy group attached to said transition metal and

(2) at least one organozinc compound; and wherein

(a) the components are added in the order (A), (B), (C) and (D) or (A), (B), (D) and (C); and

(b) the components are employed in quantities so as to provide the following atomic ratios Mg:Tm of from about 0.1:1 to about 100:1;

Zn:Tm of from about 0.05:1 to about 10:1;

Cl:Mg of from about 2:1 to about 20:1; and

the OH:total number of hydrocarbyl groups attached to a metal atom in component (A) is from about 0.5:1 to about 1.5:1.

4,456,548

COMPOSITION AND METHOD FOR MAKING CONDUCTIVE POLYMERS

David Lewis; Davida W. Kalina, both of Naperville, and Tsung-Ein Tsai, Warrenville, all of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 309,829, Oct. 8, 1981, abandoned. This application Oct. 15, 1982, Ser. No. 434,599

Int. Cl.³ C08K *3/16*

U.S. Cl. 252—500 **13 Claims**

1. The composition prepared by the process which comprises contacting a modified polymer selected from the group consisting of condensed polyacrylonitrile, condensed substituted polyacrylonitrile, and dehydrohalogenated polyalphahaloacrylonitrile with at least one doping reagent capable of forming a charge-transfer complex with said polymer, wherein the doping reagent is selected from the group consisting of electron-acceptors and electron-donors and the amount of said doping reagent is effective to increase the electrical conductivity of said polymer.

4,456,549

PASTE FOR FORMATION OF TRANSPARENT ELECTROCONDUCTIVE COATING FILM AND PROCESS FOR PREPARATION OF SAID PASTE

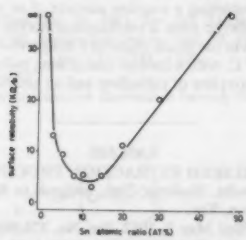
Mitsuru Kano, Furukawa; Jun Nakanowatari, Miyagi, and Yoshimi Kamijyo, Furukawa, all of Japan, assignors to Alps Electric Co., Ltd., Japan

Filed Sep. 30, 1982, Ser. No. 431,323

Claims priority, application Japan, Nov. 25, 1981, 56-188886

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—518 **12 Claims**



1. A paste for the formation of a transparent electroconductive coating film by screen printing comprising an organic indium complex having an oxygen atom directly coordinated to the indium atom, said complex being capable of forming an indium oxide film by sintering, an organic tin compound capable of forming a tin oxide film by sintering in an amount such that the Sn to (In+Sn) atomic ratio is 2 to 20%, an organic viscosity builder capable of complete thermal decomposition at a temperature lower than 500° C. and selected from the group consisting of ethyl cellulose, nitrocellulose, acetyl cellulose and benzyl cellulose and an inert organic solvent.

4,456,550

VASCULAR PERMEABILITY FACTOR

Harold F. Dvorak, Newton Center, and Donald R. Senger, Medfield, both of Mass., assignors to President and Fellows of Harvard College, Cambridge, Mass.

Filed Nov. 22, 1982, Ser. No. 443,209

Int. Cl.³ C07G *7/00*; A61K *27/00*

U.S. Cl. 260—112 R **9 Claims**

1. A fast-acting purified protein factor which affects vascular permeability within 5 minutes of the time of injection and has little residual effect 20 minutes after injection and has the following characteristics:

(a) in an aqueous solution (0.01 M Na_3PO_4, pH 7) whose concentration of NaCl is varied linearly, the factor is eluted from a heparin-Sepharose chromatography column in a peak centered at 0.4 M NaCl;

(b) in an aqueous solution of Na_3PO_4 (pH 7.0) whose concentration is varied linearly, the factor is eluted from a hydroxylapatite column in a peak centered at 0.25 M Na_3PO_4;

(c) when subjected to SDS gel electrophoresis in a 7.5% polyacrylamide slab gel (0.375 M tris-HCl (pH 8.8), 0.1% SDS) at 35 milliamps, 4° C., the factor is localized to a region corresponding to a molecular weight between 34,000 and 45,000 daltons.

4,456,551

AZO DYES FROM 2-AMINO-5-ALKYLTHIO-1,3,4-THIADIAZOLES AND N-ACYLOXYALKYL-M-ACYLAMIDOANILINES

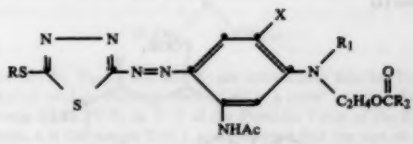
Max A. Weaver, and Clarence A. Coates, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 315,106, Oct. 26, 1981, abandoned. This application Jul. 11, 1983, Ser. No. 512,867

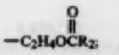
Int. Cl.³ C09B *29/039, 29/09*; D06P *1/18, 3/54*

U.S. Cl. 260—158 **8 Claims**

1. A compound having the formula:



wherein R is alkyl; X is hydrogen, or alkyl; R_1 is hydrogen, alkyl, aralkyl or



R_2 is alkyl, aryl, aralkyl, cycloalkyl, alkylamino, or arylamino; and Ac is formyl or alkanoyl; and wherein R and the alkyl, aryl and cycloalkyl moieties of R_2 and the alkanoyl moiety of Ac are unsubstituted or substituted with 1–3 groups independently selected from alkyl, aryl, cycloalkyl, —OH, OOC-alkyl, —COO-alkyl, succinimido, phthalimido, alkoxy, carbamoyl, alkylcarbamoyl, dialkylcarbamoyl, alkanoylamino, halogen, phenoxy and benzoyloxy.

4,456,552

1,4-BIS(SUBSTITUTED-AMINO)-5,8-DIHYDROXYANTHRAQUINONES AND LEUCO BASES THEREOF

Keith C. Murdock, Pearl River, N.Y., and Frederick E. Durr, Ridgewood, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 63,285, Aug. 2, 1979, Pat. No. 4,278,689, which is a division of Ser. No. 923,602, Jul. 11, 1978, Pat. No. 4,197,249, which is a continuation-in-part of Ser. No. 873,040, Jan. 30, 1978, abandoned, which is a continuation-in-part of Ser. No. 824,872, Aug. 15, 1977, abandoned. This application Mar. 2, 1981, Ser. No. 239,939

Int. Cl.³ C07C 97/26; A61K 31/125

U.S. Cl. 260—377 5 Claims

1. A compound selected from the group consisting of 1,4-bis[2-(2-aminoethylamino)ethylamino]-5,8-dihydroxyanthaquinone, the leuco base and tautomer thereof and the pharmacologically acceptable acid-addition salts thereof.

5. A compound selected from the group consisting of 1,4-bis[2-(N-(β-hydroxyethyl)trifluoroacetamido)ethylamino]-5,8-dihydroxyanthraquinone, the leuco base and tautomer thereof and the pharmacologically acceptable acid-addition salts thereof.

4,456,553

VITAMIN D_3 DERIVATIVES, PROCESS FOR PREPARATION THEREOF, AND ANTIGENS COMPRISING SAID DERIVATIVES TO BE USED FOR PREPARATION OF ANTIBODIES FOR IMMUNOCHEMICAL ASSAY AND ANTIBODIES PREPARED THEREFROM

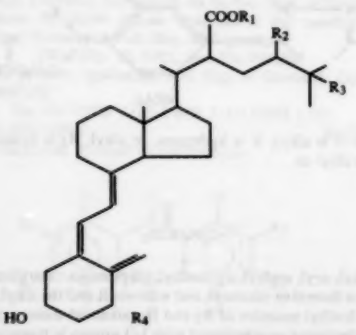
Jun-ichi Oshida, Yamaguchi; Osamu Nishikawa, Tokyo; Hideki Tsuruta, Yamaguchi; Toru Takeshita, Tokyo; Itaru Yamamoto, Okayama, and Kenji Ishimaru, Yamaguchi, all of Japan, assignors to Teijin Limited, Osaka, Japan

Continuation-in-part of Ser. No. 376,055, May 7, 1982, abandoned. This application May 18, 1983, Ser. No. 495,877

Int. Cl.³ C07J 9/00

U.S. Cl. 260—397.2 6 Claims

1. A vitamin D_3 derivative expressed by the following formula (I)



(I)

wherein R_1 is a hydrogen atom or an alkyl group with 1 to 6 carbon atoms having a carboxyl group or amino group; R_2, R_3, and R_4 independently indicate a hydrogen atom or hydroxyl group.

4,456,554

AMMONIUM COMPOUNDS

Klaus Walz; Karl Schäfer; Günther Hoffarth, all of Leverkusen, and Hans Schulze, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

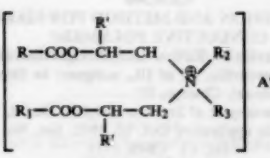
Filed Sep. 13, 1982, Ser. No. 417,828

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1981, 3137043

Int. Cl.³ C11C 3/00

U.S. Cl. 260—403 7 Claims

1. Ammonium compounds of the formula



(I)

in which

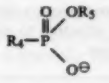
R and R_1 designate C_1–C_{21}-alkyl or C_2–C_{21}-alkenyl,

R′ designates hydrogen or C_1–C_4-alkyl,

R_2 designates C_1–C_4-alkyl or hydroxy-C_1–C_4-alkyl,

R_3 designates hydrogen or C_1–C_4-alkyl and

$A^{\ominus}$ represents an anion of the formula



(II)

in which

R_4 designates hydrogen, C_1–C_4-alkyl or C_1–C_4-alkoxy and

R_5 designates C_1–C_4-alkyl or C_1–C_4-hydroxyalkyl.

4,456,555

MANUFACTURE OF ARYL ESTERS

Anil B. Goel, Worthington, and Robert A. Grimm, Columbus, both of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 13, 1982, Ser. No. 416,810

Int. Cl.³ C11C 3/02; C09F 5/08

U.S. Cl. 260—410 11 Claims

1. An oxidation process for the manufacture of aryl esters comprising contacting a reaction mixture of an aromatic compound, a carboxylic acid, a perfluorocarboxylic acid and molecular oxygen in the liquid phase at a temperature in the range of 100° to 300° C. with a catalyst comprising palladium carboxylate or a carboxylate of palladium and an antimony carboxylate.

4,456,556

OILSEED EXTRACTION PROCESS

Frank N. Grimsby, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 7, 1982, Ser. No. 376,086

Int. Cl.³ C07F 5/02; C11B 1/00

U.S. Cl. 260—412.4 4 Claims

1. In a process for the solvent extraction of oil from oil-containing seeds, comprising steps for (a) contacting in an extractor the oilseeds with an isopropanol-based extraction solvent to obtain an extract miscella of seedoil in solvent and a seed meal containing adsorbed solvent, (b) cooling and phase separating the miscella to recover solvent from the extracted oil, (c) recycling said solvent recovered from the miscella to the extractor, (d) heating the seed meal in a desolventizing/toasting zone to obtain a solvent vapor, (e) condensing the solvent vapor, and (f) recycling solvent vapor condensate to the extractor, the improvement which comprises additional steps for

contacting in a vapor/liquid contact zone the solvent vapor evaporated from the seed meal, before condensation, with a contact liquid which is an isopropanol-based process solvent stream having a water content less than the water content of the solvent vapor, withdrawing vapor from the contact zone and introducing said vapor to the condensation zone as solvent vapor, and withdrawing liquid from the contact zone and introducing said liquid to the desolventizing/toasting zone.

4,456,557

OILSEED EXTRACTION PROCESS

Frank N. Grimsby, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 7, 1982, Ser. No. 376,087
Int. Cl.³ C07F *5/02*; C11B *1/00*
U.S. Cl. 260—412.4 **6 Claims**

1. A process for the separation of oils from seeds containing extractible oils, which comprises steps for contacting the seeds in a presoaking zone with an isopropanol-based presoak solvent to obtain presoaked seeds, extracting the presoaked seeds by contact with an isopropanol-based extraction solvent containing between about 10 and 20 percent by weight water in a multi-stage countercurrent extraction zone to obtain an extraction miscella and an extracted seed meal, and recovering oils from the extraction miscella, under the provision that the weight ratio of water to isopropanol in the presoak solvent is less than the weight ratio of water to isopropanol in the extraction miscella.

4,456,558

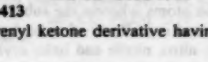
POLYPRENYL KETONE DERIVATIVES

Akio Sato; Kenji Nakajima, both of Ibaragi; Yoshimasa Takahara, Narashino; Shizumasa Kijima, Niiza; Isao Yamatsu, Kawaguchi; Kouichi Suzuki, Kakamigahara; Takeshi Suzuki, Abiko, and Toshihiko Nakamura, Tokyo, all of Japan, assignors to Eisai Co., Ltd. and General Director of the Agency of Industrial Science and Technology, both of Tokyo, Japan

Filed Oct. 16, 1981, Ser. No. 312,068
Claims priority, application Japan, Oct. 23, 1980, 55-148831
Int. Cl.³ C11C *1/00*
U.S. Cl. 260—413 **16 Claims**

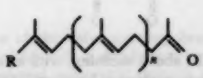
1. A polyprenyl ketone derivative having the general formula:

(I)



wherein n is an integer of 1 to 5, and R is —COOH or —CH$_2$OH.

10. A polyprenyl ketone derivative having the general formula:



wherein n is an integer of from 2 to 5, and R is —COOH, —CH$_2$OH or —CHO.

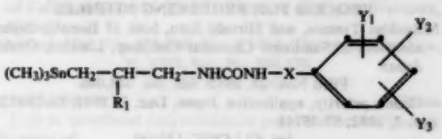
4,456,559

PESTICIDAL N-(3-TRIMETHYLSTANNYLALKYLENE)-N'-PHENYLSULFONYL OR -BENZOYL-UREAS

Jozef Drabek, Oberwil, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 6, 1982, Ser. No. 433,190
Claims priority, application Switzerland, Oct. 8, 1981, 6456/81; Oct. 22, 1981, 6750/81; May 28, 1982, 3316/82; Jun. 3, 1982, 3415/82
Int. Cl.³ C07F *7/22*
U.S. Cl. 260—429.7 **7 Claims**

1. An N-(3-trimethylstannylalkylene)-N'-phenylsulfonyl- or -benzoylurea of the formula



wherein R_1 is hydrogen, C_1–C_6-alkyl or C_3–C_8-cycloalkyl, X is —CO— or —SO_2—, and Y_1, Y_2 and Y_3 independently of one another are each hydrogen, halogen, C_1–C_6-alkyl, C_1–C_6-haloalkyl, C_1–C_6-alkoxy or nitro.

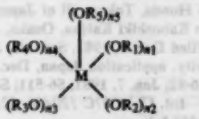
4,456,560

PROCESS FOR THE PREPARATION OF N-ALLYL-O-ALKYL THIONOCARBAMATES

Morris E. Lewellyn, Bridgeport, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Aug. 23, 1982, Ser. No. 410,773
Int. Cl.³ C07C *155/02*
U.S. Cl. 260—455 A **12 Claims**

1. In a process for the preparation of N-allyl-O-alkyl thionocarbamates by reaction of an allyl isothiocyanate with an alcohol in the presence of a catalytic amount of a catalyst, the improvement comprising: said catalyst being a compound having the general formula:



wherein R_1, R_2, R_3, R_4, and R_5 are individually selected from alkyl or aryl or mixtures thereof, M is a metal selected from Group III B, IV B, or V B of the Periodic Table of the Elements, n is the integer 0 or 1, and provided that the sum of n_1, n_2, n_3, n_4, and n_5 equals the valence of the metal; said improvement thereby providing improved catalysis for said reaction.

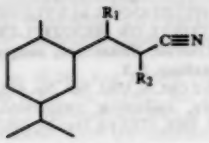
4,456,561

NITRILES AND USE AS PERFUME CHEMICALS

Willem Lenselink, Voorthuizen, Netherlands, assignor to Polak's Frutal Works, B.V., Amersfoort, Netherlands

Division of Ser. No. 123,581, Feb. 22, 1980, Pat. No. 4,336,204, which is a division of Ser. No. 20,308, Mar. 14, 1979, Pat. No. 4,235,805. This application Feb. 22, 1982, Ser. No. 351,088
Claims priority, application United Kingdom, Mar. 20, 1978, 10938/78
Int. Cl.³ C07C *121/46*
U.S. Cl. 260—464 **1 Claim**

1. A compound having the formula:



wherein R_1 is hydrogen and R_2 is hydrogen or an alkyl group of 1 to 6 carbon atoms.

4,456,562

PROCESS FOR PRODUCING NITRILES

Mitsuhisa Tamura, and Hiroshi Sato, both of Ibaraki, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 23, 1982, Ser. No. 444,046

Claims priority, application Japan, Dec. 2, 1981, 56-194128; Apr. 2, 1982, 57-55741

Int. Cl.³ C07C *120/00*

U.S. Cl. 260—465 F 7 Claims

1. In a process for producing a nitrile compound from a corresponding aldehyde exhibited by the general formula (I) and a hydroxylamine inorganic acid salt

$$R^1CHO \quad (I)$$

or from an aldoxime exhibited by the general formula (II),

$$R^2CH{=}NOH \quad (II)$$

(in the general formulas shown hereinabove, R^1 represents an aryl group having 6 to 9 carbon atoms and R^2 represents an alkyl or alkenyl group having 1 to 9 carbon atoms or an aryl group having 6 to 9 carbon atoms), a process, wherein water produced in the reaction is azeotropically distilled out of the reaction system with the aid of a solvent which makes an azeotropic mixture with water.

4,456,563

PROCESS FOR PRODUCING MALONONITRILE

Tsutomu Katsumata, Yokohama; Tetsuro Dozono, Yokosuka, and Makoto Honda, Tokyo, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 3, 1981, Ser. No. 326,945

Claims priority, application Japan, Dec. 3, 1980, 55-169411; Jan. 6, 1981, 56-82; Jan. 7, 1981, 56-511; Sep. 8, 1981, 56-68285

Int. Cl.³ C07C *120/00, 121/22*

U.S. Cl. 260—465.8 R 5 Claims

1. A method for catalytically producing malononitrile, comprising subjecting β-aminopropionitrile to an oxidative dehydrogenation in the absence of ammonia in a gaseous phase with molecular oxygen at a temperature of from 350° C. to 550° C. in the presence of a catalyst comprising at least one member selected from the group consisting of molybdenum oxide and oxide compositions of molybdenum and at least one member selected from the group consisting of titanium, vanadium, chromium, manganese, iron, cobalt, nickel, aluminum, tin, antimony, tellurium, bismuth, thallium, phosphorous, boron, alkali metals, alkaline earth metals, and rare earth metals.

4,456,564

RECOVERY OF PETROLEUM SULFONATE SALT

Paul R. Stapp, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Sep. 24, 1979, Ser. No. 78,528

Int. Cl.³ C07B *13/00*

U.S. Cl. 260—504 S 10 Claims

1. A process for the recovery of deoiled monosulfonated oil salt from a mass containing it together with unsulfonated oil, polysulfonated oil salt and some mineral matter which comprises diluting the mass with an aqueous-alcoholic solution, extracting the diluted mass with an extractant suitable to remove therefrom an extract containing unsulfonated oil, removing substantially the alcohol and water from a remaining raffinate phase, diluting or dissolving sulfonate salts, thus concentrated, with or in water, and extracting the mass thus obtained with another extractant suitable to remove therefrom an extract containing a concentration of monosulfonate salt.

4,456,565

PROCESS FOR THE PREPARATION OF ACYL CYANIDES

Kurt Findeisen, Odenthal, and Herbert Schwarz, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 301,336, Sep. 11, 1981, abandoned, which is a continuation of Ser. No. 165,454, Jul. 2, 1980, abandoned, which is a continuation of Ser. No. 047,604, Jun. 11, 1979, abandoned, which is a continuation-in-part of Ser. No. 967,934, Dec. 9, 1978, Pat. No. 4,238,412, which is a continuation of Ser. No. 777,287, Mar. 11, 1977, abandoned.

This application Jul. 14, 1983, Ser. No. 513,260

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1976, 2614241

Int. Cl.³ C07C *120/00*

U.S. Cl. 260—545 R 18 Claims

1. A process for the preparation of an acyl cyanide of the general formula

$$R{-}\overset{\overset{O}{\|}}{C}{-}CN, \quad (I)$$

in which R represents alkyl or substituted alkyl of from 1 to 8 carbon atoms, wherein the substituents are selected from alkoxy or carbalkoxy of up to 4 carbon atoms in the alkoxy moiety, nitro, nitrile and halo; cycloalkyl or substituted cycloalkyl with 3 to 12 carbon atoms wherein the substituent is selected from alkyl, alkoxy and carbalkoxy of up to 4 carbon atoms in each alkyl moiety, nitro, nitrile and halo; aryl or substituted aryl wherein the substituents are selected from alkyl, alkoxy and carbalkoxy of up to 4 carbon atoms in the alkyl moiety, nitro and halo; or an optionally substituted 5-membered or 6-membered heterocyclic radical which can additionally also be fused with a benzene ring, wherein said substituents are selected from alkyl, alkoxy, and carbalkoxy of up to 4 carbon atoms in each alkyl moiety, nitro, nitrile and halo; which process consists of reacting a carboxylic acid anhydride of the general formula

$$R{-}\overset{\overset{O}{\|}}{C}{-}O{-}\overset{\overset{O}{\|}}{C}{-}R, \quad (II)$$

in which R has the above meaning, with an anhydrous hydrocyanic acid at a temperature of between 100° C. and 230° C. in the liquid phase and in the absence of a catalyst, and removing the resulting acyl cyanide from the reaction medium by distillation immediately after it has been formed.

4,456,566

PROCESS FOR PREPARING AMIDES OF METHYLPHOSPHONATES

Milton L. Honig, Bronx, and Edward D. Weil, Hastings-on-Hudson, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 72,966, Sep. 6, 1979, Pat. No. 4,276,234, which is a division of Ser. No. 973,282, Dec. 26, 1978, Pat. No. 4,207,271, which is a division of Ser. No. 615,321, Sep. 27, 1975, Pat. No. 4,152,373. This application Jun. 9, 1980, Ser. No. 157,713

Int. Cl.³ C07F 9/44

U.S. Cl. 260—984 1 Claim

1. A process for preparing compounds having the structure:

$$CH_3P(O)(Y)(NRR')$$

wherein Y is O—Ar or NRR' and Ar is an aryl radical having from 6 to about 14 carbon atoms and R and R' are the same or different and are hydrogen, alkyl, substituted alkyl, aryl, substituted aryl, alkylene or arylene, comprising heating a diaryl methylphosphonate with compounds of the formula RR'NH, wherein R and R' are as defined above, at a temperature from about 150° C. to about 250° C. until one or two solar equivalents of the phenol corresponding to the aryl groups are released.

4,456,567

3,9-DICHLORO-2,4,8,10-TETRAOXA-3,9-DIPHOSPHASPIRO [5,5] UNDECANE-9-OXIDE AND PROCESS FOR PREPARING SAME

Ingenuin Hechenbleikner, West Cornwall, and William P. Enlow, Falls Village, both of Conn., assignors to Borg-Warner Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 321,858, Nov. 16, 1981, abandoned. This application Jul. 6, 1983, Ser. No. 511,126

Int. Cl.³ C07F 9/15

U.S. Cl. 260—985 6 Claims

1. A process for preparing an asymmetrical pentaerythritol compound containing both trivalent and pentavalent phosphorus comprising oxidizing 3,9-dichloro-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane, to form the 3,9-dichloro-3'-oxo-2,4,8,10-tetraoxa-3,9-diphosphaspiro[5,5]undecane in an anhydrous environment, and isolating said asymmetrical pentaerythritol compound.

4,456,568

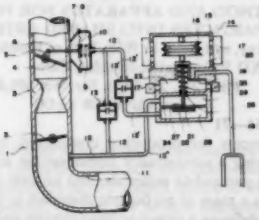
CARBURETOR CHOKE VALVE OPENING DEVICE

Tatsuya Taifu, and Hidemi Oonaka, both of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 20, 1982, Ser. No. 451,424

Int. Cl.³ F02M 1/14

U.S. Cl. 261—39 A 6 Claims



1. A carburetor choke valve opening device wherein said choke valve is linked with a diaphragm connected with an intake manifold of said carburetor through a passage with a delay element, characterized in that a changeover valve connected with a bellows of a bellows-type altitude compensator is adapted to separate a vacuum chamber and a control chamber from each other so that they can be opened and closed, said vacuum chamber being connected to said intake manifold through a passage, while said control chamber being connected to said diaphragm through another passage with another delay element.

4,456,569

ENCAPSULATION PROCESS

Marius Rodson, El Cerrito, and Herbert B. Scher, Moraga, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 383,448, Jun. 1, 1982. This application Nov. 30, 1983, Ser. No. 556,670

Int. Cl.³ B29C 13/00

U.S. Cl. 264—4.7 3 Claims

1. In an interfacial polymerization process characterized by the steps of:

(a) combining a material to be encapsulated and at least one polyisocyanate in an organic phase;

(b) incorporating a surfactant and a protective colloid in an aqueous phase;

(c) dispersing the organic phase into the aqueous phase; and

(d) forming a polyurea-microcapsule wall at the phase interface, the improvement which comprises,

using a protective colloid comprising a graft copolymer of polyvinyl alcohol and methyl vinyl ether/maleic acid.

4,456,570

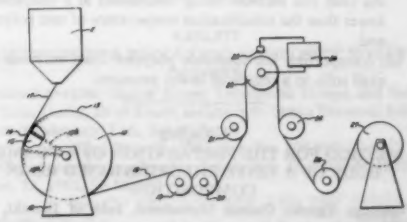
TREATMENT OF PERFORATED FILM

Paul E. Thomas, and Garland E. Raley, both of Terre Haute, Ind., assignors to Ethyl Corporation, Richmond, Va.

Filed Jul. 26, 1982, Ser. No. 401,939

Int. Cl.³ B29D 27/00

U.S. Cl. 264—22 17 Claims



1. A method of preparing a perforated sheet comprising polymeric material utilizing non-welded screens comprising the steps of:

(a) shaping into the form of a sheet, a resin selected from the group consisting of polyethylene and copolymers of ethylene and propylene, and blended therewith an effective small amount of a polarizable migrating surfactant up to about 10 percent by weight of the resin;

(b) perforating said sheet utilizing a non-welded screen;

(c) subjecting at least one surface of the perforated sheet to corona discharge treatment; and,

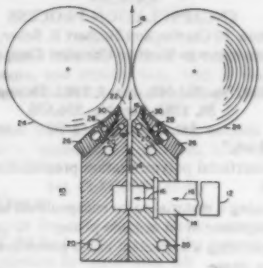
(d) recovering a perforated plastic sheet having a percent run off from zero to less than about ten percent.

4,456,571

PROCESS AND APPARATUS FOR FORMING A COMPOSITE FOAMED POLYMERIC SHEET STRUCTURE HAVING COMPARATIVELY HIGH DENSITY SKIN LAYERS AND A COMPARATIVELY LOW DENSITY CORE LAYER

David E. Johnson, Canandaigua, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 13, 1982, Ser. No. 449,126
Int. Cl.³ B29D 27/00; B29F 3/08
U.S. Cl. 264—45.5 6 Claims



1. A method for forming a polymeric sheet structure having comparatively high density skin layers and a comparatively low density core layer comprising:

(a) extruding molten polymer containing a foaming agent therein through a slot die, into a post extrusion region defined by said die and two spaced rotating chill rolls which are spaced from said die;

(b) maintaining said post extrusion region at a pressure sufficient to at least inhibit expansion of said formable molten polymer with cooled sealing means which occupy a substantial portion of the space between said die and said rolls and are spaced from said rolls, said rolls and said sealing means being cooled so that said foamble molten polymer in the space between said rolls and said sealing means is solidified;

(c) transporting said extruded foamable molten polymer between, and into contact with and through the chill rolls, the chill roll surfaces being maintained at a temperature lower than the solidification temperature of said polymer; and

(d) transporting the foamable polymer from between said chill rolls to a region of lower pressure.

4,456,572

METHOD FOR THE PREPARATION OF A FOAMED BODY OF A VINYL CHLORIDE-BASED RESIN COMPOSITION

Yoshitagu Eguchi; Osamu Matsumoto, both of Ibaraki, and Kiyoshi Imada, Saitama, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd., Tokyo, Japan

Filed Nov. 15, 1982, Ser. No. 441,945
Claims priority, application Japan, Nov. 16, 1981, 56-183349; Nov. 19, 1981, 56-185968
Int. Cl.³ B29D 27/00
U.S. Cl. 264—53 12 Claims

1. A method for the preparation of a foamed body of a vinyl chloride-based resin composition which comprises the steps of

(a) heating a resin composition mainly composed of a vinyl chloride-based resin,

(b) impregnating the thus heated resin composition with a binary volatilizable blowing agent composed of

(i) at least one kind of first volatilizable organic compounds selected from the group consisting of aliphatic hydrocarbons and halogenated aliphatic hydrocarbons having a boiling point not higher than 90° C., and

(ii) at least one kind of second volatilizable organic compounds selected from the group consisting of aromatic hydrocarbons, halogenated aromatic hydrocarbons, ethers, ketones and esters having compatibility with the vinyl chloride-based resin, under pressurization,

(c) melting and mixing the resin composition to effect uniform dispersion of the blowing agent therein, and

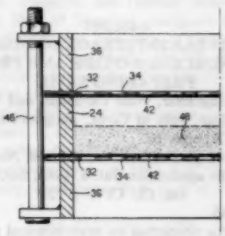
(d) bringing the resin composition thus impregnated with the blowing agent under a reduced pressure so as to expand the resin composition by the volatilization of the blowing agent.

4,456,573

METHOD FOR THE PRODUCTION OF AGED AND EXPANDED POLYSTYRENE PANELS

Franco Ragazzini, and Roberto Colombo, both of Turin, Italy, assignors to Lavorazione Materie Plastiche L.M.P. S.p.A., Turin, Italy

Filed Jul. 2, 1982, Ser. No. 394,581
Claims priority, application Italy, Jul. 27, 1981, 68043 A/81
Int. Cl.³ B29D 27/00
U.S. Cl. 264—53 2 Claims



1. A process for obtaining an expanded polystyrene panel comprising aging pre-expanded extruded panels of polystyrene at approximately room temperature for approximately a month, placing each of said pre-expanded aged panels into a mold box having a length and width slightly larger than the length and width of each panel and a depth approximately 1.6 to 2 times the thickness of each panel, heating each panel in said mold box by circulating a heated fluid in adjacency to said panel, thereby further expanding said panel into full engagement with said mold box to obtain an expanded panel having a density below 25 KG/C.M. and a modulus of elasticity in compression above 60 KG/SQ C.M.

4,456,574

METHOD AND APPARATUS FOR FORMING PARTICLES INTO SHAPED ARTICLES

David J. Frey, and Keith E. Wier, both of Boulder, Colo., assignors to SXD Refractories, Boulder, Colo.

Filed Jul. 23, 1982, Ser. No. 401,422
Int. Cl.³ B30B 11/00
U.S. Cl. 264—71 2 Claims

1. A process for producing compacted, bonded, molded shapes having a substantially homogeneous and dense nature from loose particulate materials, said process comprising:

charging a mass of particulate materials to the interior of a mold defining a closed volume therein and having at least one movable wall in part defining the volume,

placing the mold upon an oscillating table,

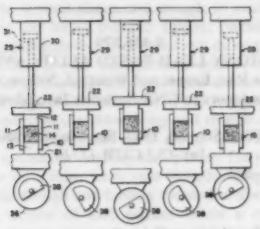
applying to the movable plate, an initial force to bear against the particles of a magnitude less than that required to bond the particles,

initially moving the mold with the oscillating table against the underdamped energy storing restraining means,

impelling the mold from the table to move with the energy storing dampening means as the table moves towards the dampening means,

thrusting the mold towards the table as the energy storing dampening means rebounds,

impacting the mold against the oscillating table as the dampening means moves towards the table and the table moves towards the mold at a sufficient rate to induce an average acceleration of at least 25 G's upon the defined mass,



repeating the oscillating impacts of the mold moving with the dampening means and oscillating table to maintain an oscillating impact condition, to thereby

compact and bond the particles within the mold as a result of the inertial forces generated by the accelerations acting between the individual particles,

stopping the oscillating impacts, and

removing the molded shape from the mold.

4,456,575

PROCESS FOR FORMING A CONTINUOUS FILAMENT YARN FROM A MELT SPINNABLE SYNTHETIC POLYMER

Francis S. Smith, and Jack Gould, both of Harrogate, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 230,553, Feb. 2, 1981, abandoned. This application Sep. 17, 1982, Ser. No. 419,243

Claims priority, application United Kingdom, Feb. 18, 1980, 8005386; Dec. 12, 1980, 8039819

Int. Cl.³ D01D *5/12*

U.S. Cl. 264—176 F **6 Claims**

1. A process for forming a continuous filament yarn from a melt-spinnable synthetic linear polymer comprising extruding the molten polymer through a shaped orifice to form a molten filamentary material, passing the molten filamentary material in the direction of its length through a solidification zone wherein the molten filamentary material is solidified, passing the solidified filamentary material in the direction of its length through a conditioning zone provided with a gaseous atmosphere at a temperature above the glass transition temperature of the material and below its melting temperture, withdrawing the resulting filamentary yarn from the conditioning zone and winding up such yarn at a velocity in excess of 3000 meters per minute, the improvement being that the gaseous atmosphere in the conditioning zone is compressed steam at an absolute pressure in excess of 5 psig.

4,456,576

METHOD OF FLUSHLY EMBEDDING AN INLAY

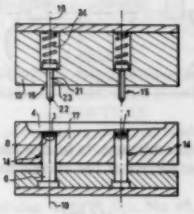
André Cotte, Chabreloche, France, assignor to Etablissements Marcel Cotte, France

Filed May 13, 1981, Ser. No. 263,056

Claims priority, application France, May 13, 1980, 80 10723

Int. Cl.³ B29C *5/08, 6/00*; B29D *3/00, 9/00*

U.S. Cl. 264—255 **13 Claims**



1. A method for the flush embedding of a stiff inlay piece having a certain malleability and at least a quasi-flat initial form into a curved surface or a rigid substantially solid main piece made by using a mold, comprising before filling the mold with a material constituting the main piece, the steps of holding the inlay on a support means having a curved surface substantially the same shape as the main piece, introducing said inlay into the mold and placing it in a relative position corresponding to a location which it is to occupy on the piece made in the mold, fixedly holding the inlay in this position and forcibly pressing and deforming the inlay piece, by pressing the point of a conical pressure means against the inlay piece on the support so that the deformation of the stiff inlay is permanent, the pressure means being located on the side of said inlay opposite to that held on said support means so that said inlay assumes a shape complementary to that of the mold, the pressure means and the support means being moved in opposite directions.

4,456,577

METHODS FOR PRODUCING COMPOSITE ROTARY DRESSER

Takao Kawakita, Osaka; Kazuo Yamaguchi, Hyogo, and Sadao Date, Osaka, all of Japan, assignors to Osaka Diamond Industrial Company, Ltd., Sakai, Japan

Filed May 11, 1982, Ser. No. 376,992

Claims priority, application Japan, Sep. 25, 1981, 56-152493; Nov. 13, 1981, 56-182909

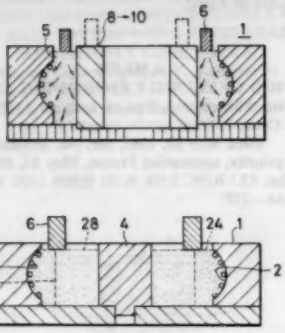
Int. Cl.³ B22F *7/00, 7/06, 7/02, 7/04*

U.S. Cl. 419—7 **10 Claims**

1. A method of producing a rotary dresser, comprising; providing an outer mold member including a super-abrasive material; placing an iron-base powder compact near the center of said mold member; filling a wear resistant metallic powder mixture between said mold member and said compact; and heating the construction while melting an infiltrant thereinto, to form a sintered body bonded by said infiltrant and having said super-abrasive surface at the outside thereof.

8. A method of producing a rotary dresser, comprising; providing an outer mold member including a super-abrasive material; placing a core means near the center of said mold member; concentrically filling, from said mold member, a tungsten base powder mixture and an iron-base powder mixture between said mold member and said core means, placing

an infiltrant on the assembly and heating the assembly to infiltrate said infiltrant into said powder mixtures, said infiltrant



bonding said powder mixtures, to form a sintered body having said super-abrasive surface at the outside thereof.

4,456,578

METHOD AND APPARATUS FOR PRODUCING A FRICTION ELEMENT FOR A DISC BRAKE

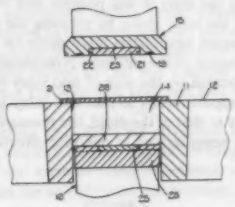
Melvyn Ward, Worcestershire, England, assignor to Lucas Industries, Birmingham, England

Filed Aug. 26, 1982, Ser. No. 411,842

Claims priority, application United Kingdom, Sep. 3, 1981, 8126682

Int. Cl.³ B22F *3/14*

U.S. Cl. 419—8 **16 Claims**



1. A method of producing a friction element for a motor car or motor cycle disc brake, the friction element including a sintered friction pad **(10)** bonded to an electrically conductive backing plate **(9)**, and the method comprising the steps of:

(a) introducing a powdered friction material **(14)** which, on sintering, will produce the required friction pad **(10)** into a die cavity defining the shape of the pad, the die cavity being closed at one end by the backing plate **(9)** and the friction material **(14)** contacting one major surface of the backing plate **(9)**,

(b) engaging a first resistance heating electrode **(15,115)** with the other major surface of the backing plate **(9)**, the first electrode **(15,115)** contacting the backing plate **(9)** through an end surface of the electrode which is formed with a recess **(18, 118)**: which is at least partly filled by an insert **(21,121)** formed of a material which is less electrically conductive than the remainder of the first electrode **(15, 115)**,

(c) introducing a second resistance heating electrode **(16, 116)** into the die cavity so that the powdered friction material **(14)** is contained between, and is in electrical contact with, the first and second electrodes **(15, 115** and **16, 116)**.

(d) causing the first and second electrodes **(15, 115** and **16, 116)** to undergo movement relative to and towards each other so as to compress the friction material **(14)** in the die cavity against the backing plate **(9)**, and

(e) simultaneously with step (d) passing an electric current between the electrodes **(15, 115** and **16, 116)** through the backing plate **(9)** and the friction material **(14)** to sinter the friction material **(14)** into the required friction pad **(10)** and bond the pad **(10)** to the backing plate **(9)**.

16. A friction element for a motor car or motor cycle disc brake, produced by the method as claimed in any one of claims **1, 2, 4,** and **6-13.**

4,456,579

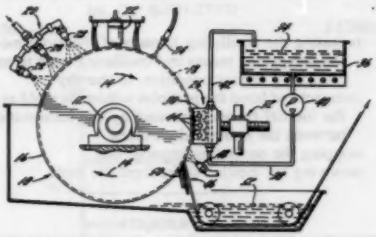
LOW ANTIMONY LEAD-BASED ALLOY AND METHOD

Purushothama Rao, Eagan, and Wendy J. Nelson, Cloquet, both of Minn., assignors to GNB Batteries Inc., Mendota Heights, Minn.

Filed Sep. 30, 1982, Ser. No. 431,950

Int. Cl.³ C22B *11/10*

U.S. Cl. 420—566 **16 Claims**



1. In a method of casting a continuous strip of battery grids which comprises rotating an arcuate surface having the desired grid pattern thereon, forming a mold at one section of the arcuate surface, filling said mold with a molten alloy to continuously form a strip and thereafter removing said strip from said arcuate surface, the improvement wherein said molten alloy is a lead-based alloy consisting essentially of:

from about 0.8 to about 1.6 wt. % antimony;

from about 0.08 to about 0.16 wt. % arsenic;

from about 0.006 to about 0.012 wt. % silver;

and the balance lead.

4,456,580

AUTOMATIC APPARATUS FOR ANALYZING METALS

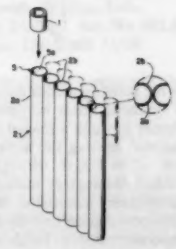
Takeshi Yamada; Hideki Ohashi, and Masahiro Tanimoto, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Feb. 17, 1982, Ser. No. 349,664

Claims priority, application Japan, Sep. 17, 1981, 56-148412

Int. Cl.³ G01N *1/00, 35/04*

U.S. Cl. 422—63 **11 Claims**



1. An automatic apparatus for loading and feeding crucibles to and removing crucibles from a combustion furnace in which

metals are burned for analyzing them, said apparatus comprising:

means for automatically transporting crucibles one at a time to a sample weighing position where they can have a sample placed therein;

a sampling weighing means at said sample weighing position;

a storage means adjacent said weighing position for automatically storing crucibles containing samples therein, said storage means having a carrying trough for holding a line of crucibles and having an upstream end for receiving crucibles one by one from said weighing means, a stop at the downstream end of said carrying trough against which a crucible moved along said trough to said downstream end abuts for being blocked against further movement, said stop being movable into and out of engagement with the crucible at the downstream end of said carrying trough for permitting the crucible at the downstream end of said trough to be taken out of the trough, and a means for transporting crucibles along said trough consisting of a pusher reciprocally movable along said trough, pusher driving means for moving said pusher for pushing crucibles one at a time from said sample weighing position along said trough and having means for discontinuing the pushing action of said pusher when a crucible being pushed engages said stop or a crucible preceding a crucible which has been stopped by said stop;

means for taking crucibles out of said weighing position one at a time and placing them on said upstream end of said trough;

means adjacent the downstream end of said trough for taking crucibles out of the downstream end of said trough one by one;

means for automatically taking crucibles from said taking out means and introducing them into a combustion furnace and removing said crucibles from the combustion furnace; and

means for automatically dumping crucibles removed from the combustion furnace after the completion of analysis.

4,456,581

CENTRIFUGAL ANALYZER ROTOR UNIT AND INSERT ELEMENTS

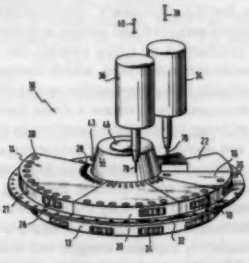
Hermann Edelmann, Tutzing-Unterzeismering; Manfred Pasch, Tutzing; Sigmar Klose, Berg; Hans-Peter Haar, and Karlheinz Mann, both of Weilheim, all of Fed. Rep. of Germany, assignors to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Nov. 20, 1981, Ser. No. 323,343

Claims priority, application Fed. Rep. of Germany, Nov. 25, 1980, 3044372

Int. Cl.³ G01N *21/07, 35/00*

U.S. Cl. 422—72 **9 Claims**



1. In a centrifugal analyzer having a rotatably driven circular rotor base, the improvement comprising: a rotor head comprising at least one sample analysis insert element including a housing having a radially inner portion and a radially outer portion, first means forming at least one sample chamber at the inner portion of the housing, second means forming at least one measuring chamber at the outer portion of the housing, third means forming a fluid channel between the sample and measuring chambers along a radial path and at least one storage stable reagent disposed in the liquid channel; at least one sample obtaining insert element including a housing having a radially inner end and a radially outer end, means forming a cylinder within the housing and extending from the inner end to the outer end, a piston slidably movable in the cylinder, injection needle connection means disposed on the inner end in communication with the cylinder, an aperture at said outer end for receiving a piston rod and piston rod connecting means on said piston; and means releasably mounting each insert element on the rotor base at any one of a plurality of different selectable angular positions wherein the insert elements are positionally stable when the rotor base is rotating.

4,456,582

MANUFACTURE OF NITROGEN-CONTAINING CRYSTALLINE METAL SILICATES HAVING A ZEOLITE STRUCTURE

Laszlo Marosi, Ludwigshafen; Joachim Stabenow, Weinheim, and Matthias Schwarzmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 4, 1979, Ser. No. 45,175

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1978, 2830787

Int. Cl.³ C01B *33/28, 33/20, 35/10*

U.S. Cl. 423—277 **8 Claims**

1. A process for the manufacture of a nitrogen-containing crystalline metal silicate having a zeolite structure which comprises:

adding a metal oxide, metal hydroxide, metal sulfate, metal nitrate or hydrated metal oxide and a silicon dioxide source that is essentially free of alkali metal to a 5 to 90% strength aqueous solution of hexamethylenediamine to form a mixture that is essentially free of alkali metal;

stirring the mixture to form a homogeneous gel; and thereafter heating the gel to form the crystalline metal silicate; wherein said metal is selected from the group consisting of aluminum, boron, arsenic, antimony, vanadium, iron and chromium, and

whereby said crystalline metal silicate is essentially free of alkali metal.

4,456,583

PREPARATION OF SIMPLE NITRONIUM SALTS

Ronald A. DeMarco, Fairfax, Va., and Michael J. Moran, E. Norriton, Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 29, 1983, Ser. No. 508,774

Int. Cl.³ C01B *21/52, 25/10, 33/20*

U.S. Cl. 423—277 **9 Claims**

1. A process for the preparation of a simple nitronium salt, the steps of which comprise:

selecting a simple nitronium salt former having the formula MF_n, wherein M is selected from the group consisting of arsenic, boron, and phosphorus, and n is an integer equal to the maximum valence state of the substance M;

condensing nitrogen dioxide into a vessel;

condensing an essentially equimolar amount of said simple nitronium salt former in said vessel on top of said condensed nitrogen dioxide;

admitting an at least stoichiometric amount of fluorine gas into said vessel;

allowing said vessel and its contents to warm until the reaction $NO_2+MF_n+\frac{1}{2}F_2 \rightarrow NO_2MF_y$, wherein y is an integer equal to n+1, occurs to form said simple nitronium salt;

isolating said nitronium salt.

4,456,584

SYNTHESIS OF SODIUM ALUMINUM HYDRIDE

Marcellan F. Gautreaux, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed May 20, 1983, Ser. No. 496,474
Int. Cl.³ C01B 6/24
U.S. Cl. 423—644 25 Claims

1. In a process for the preparation of sodium aluminum tetrahydride by reaction among sodium, aluminum and hydrogen at an elevated temperature and pressure in a liquid reaction medium in which sodium aluminum tetrahydride is soluble, the improvement which comprises performing the reaction in a semi-continuous manner whereby in at least one run the reaction is conducted to a stage at or before which the reaction rate would begin to significantly decrease due to consumption of the sodium, and at that stage separating a substantial portion of the liquid reaction mixture from the solids residue to leave a sodium- and aluminum-containing heel for use in initiating an ensuing run.

4,456,585

VISUALLY CLEAR PIGMENT-COLORED DENTIFRICE COMPOSITION

Harry Hayes, Warrington, and Kenneth Harvey, Wilmslow, both of England, assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 16, 1983, Ser. No. 494,744
Int. Cl.³ A61K 7/16
U.S. Cl. 424—49 7 Claims

1. A visually clear pigmented dentifrice colored without requiring water-soluble dyes comprising a liquid vehicle having a refractive index between about 1.36 and 1.47, up to about 10% by weight of a gelling agent, about 5-50% by weight of a polishing material having a refractive index similar to that of the said liquid vehicle, such that the said dentifrice is visually clear in appearance to the extent of being transparent or translucent when the said polishing material is dispersed in the said liquid vehicle, and about 0.001%-1% by weight of a color-intensive insoluble conjugated pigment selected from the group consisting of a phthalocyanine pigment, Pigment Red 38 and Pigment Red 39 dispersed homogeneously without dissolution throughout said dentifrice with sufficiently fine dispersion permitting retention of clarity, said dentifrice retaining color imparted by said pigment without substantial fading and with retention of clarity.

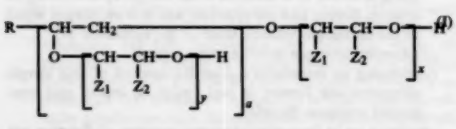
4,456,586

NON-IONIC SURFACE-ACTIVE AGENTS DERIVED FROM GLUCOSE, PROCESS FOR THEIR PREPARATION AND COMPOSITIONS CONTAINING THEM

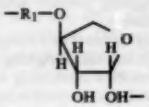
Guy Vanlerberghe, Claye-Souilly; Henri Sebag, Paris, and Rene Pierre, Aulnay-sous-Bois, all of France, assignors to L'Oreal, Paris, France

Filed Oct. 23, 1981, Ser. No. 314,400
Claims priority, application France, Oct. 24, 1980, 80 22885
Int. Cl.³ A61K 7/06; C07G 3/00
U.S. Cl. 424—70 35 Claims

1. A non-ionic surface-active product of the formula:



in which: a denotes zero or 1, R denotes a saturated or unsaturated, linear or branched aliphatic radical or an alicyclic radical containing 8 to 30 carbon atoms, x and y each denote zero or a positive number such that (x+y) denotes an integral or non-integral number from 1 to 10, and in each unit —CH—Z_1—CHZ_2—O— one of Z_1 and Z_2 denotes a hydrogen atom and the other the radical:



in which R_1 denotes methyl or ethyl.

4,456,587

PHEROMONE DELIVERY SYSTEM

Alec D. Keith, Miami, Fla., assignor to Key Pharmaceuticals, Inc., Miami, Fla.

Continuation of Ser. No. 292,484, Aug. 13, 1981, abandoned, which is a continuation of Ser. No. 167,471, Jul. 11, 1980, abandoned, which is a continuation-in-part of Ser. No. 155,746, Jun. 2, 1980, abandoned. This application Sep. 20, 1982, Ser. No. 420,347
Int. Cl.³ A01N 25/00; A61K 31/74
U.S. Cl. 424—78 3 Claims

1. An aqueous mixture for spraying onto the leaves of cotton plants consisting essentially of an amount of gossyplure effective to control the cotton boll weevil, polyvinyl pyrrolidone molecular weight from about 15,000 to about 85,000, 1.5 to 5 parts by weight per part polyvinyl pyrrolidone of polyvinyl alcohol molecular weight from about 50,000 to about 150,000, and up to about 10 parts by weight per part polyvinyl pyrrolidone of glycerol.

4,456,588

METHOD OF THE PREPARATION OF IMPROVED MUTANT STRAIN OF *BORDETELLA BRONCHISEPTICA* USEFUL AS LIVE ATTENUATED VACCINE FOR PROPHLAXIS OF *B. BRONCHISEPTICA* INFECTION

Takeshi Shimizu, K2-2, 5, Hitsujigaoka, Toyohira-ku, Sapporo-shi, Hokkaido, Japan, assignor to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, Nippon Vaccine Co., Ltd., Shimizu and Takeshi Shimizu, Sapporo, both of, Japan

Filed Jul. 21, 1982, Ser. No. 400,363
Claims priority, application Japan, Aug. 10, 1981, 56-125530
Int. Cl.³ A61K 39/10; C12N 15/00, 1/00
U.S. Cl. 424—92 10 Claims

1. A method for the preparation of a strain of *Bordetella bronchiseptica* having hereditary chromosomal markers of being temperature-sensitive and urease negative and which is useful in the production of a live vaccine for prophylaxis of *Bordetella bronchiseptica* infection, which comprises subjecting a strain of *Bordetella bronchiseptica* to a conventional means for mutating microorganisms to obtain a strain having the hereditary markers of being temperature-sensitive in that it can grow at 32° C. but not above 34° C. and urease negative, culturing the strain on a blood agar medium, picking up a cell grown with a comparatively small colony, culturing the cell on a blood agar medium, and repeating the procedure of picking up a cell and culture thereof to convert it into phase I organisms which has completely capsular antigen and is hemolytic.

7. A method for the prophylaxis of *Bordetella bronchiseptica* infection, which comprises administering to an animal an effective amount of a live attenuated vaccine prepared with a phase I strain ts-S34.u⁻ of *Bordetella bronchiseptica* having hereditary chromosomal markers of being temperature-sensitive in that it can grow at 32° C. but not above 34° C. and urease negative.

4,456,589

PREPARATION OF ANIMAL TISSUES FOR SURGICAL IMPLANTATION IN HUMAN RECIPIENTS

Daniel G. Holman, Blaine, and Arthur A. Beisang, Roseville, both of Minn., assignors to Genetic Laboratories, Inc., St. Paul, Minn.

Filed Jul. 8, 1982, Ser. No. 396,416
Int. Cl.³ A61K 35/12
U.S. Cl. 424—95 20 Claims

1. The method of preparing animal cartilage for implant use in plastic or reconstructive surgery on human subjects which includes the step of chemically tanning cleansed, dehydrated cartilage.

6. The method of treating animal tissue which has been freed of adipose tissue, comprising the steps of:

(a) dehydrating the tissue by immersion for at least 72 hours in 95% ethanol;

(b) rinsing the tissue in sterile deionized water;

(c) tanning the tissue by immersion for at least 48 hours in 0.25% glutaraldehyde;

(d) rinsing the tissue in 0.9% saline solution; and

(e) storing the tissue at room temperature in an antimicrobial medium of 99 parts by volume of 70% ethanol and 1 part by volume of propylene oxide.

4,456,590

HEAT TREATMENT OF LYOPHILIZED BLOOD CLOTTING FACTOR VIII CONCENTRATE

Alan Rubinstein, Houston, Tex., assignor to Cedars Sinai Medical Center, Los Angeles, Calif.

Continuation-in-part of Ser. No. 317,513, Nov. 2, 1981, which is a continuation of Ser. No. 295,913, Nov. 12, 1980, abandoned.
This application May 13, 1982, Ser. No. 377,863
Int. Cl.³ A61K 35/16
U.S. Cl. 424—101 4 Claims

1. A method for treating blood clotting Factor VIII concentrate in order to minimize the effect of any hepatitis virus present in the blood clotting Factor VIII concentrate, said method comprising the steps of:

lyophilizing the blood clotting Factor VIII concentrate, followed by;

heating the lyophilized blood clotting Factor VIII concentrate at a predetermined temperature of at least about 60° C. for a period of time sufficient to render hepatitis virus present in the blood clotting Factor VIII concentrate non-infectious, said heating generally decreasing as said predetermined temperature is increased.

4,456,591

THERAPEUTIC METHOD FOR ACTIVATING FACTOR VII

William R. Thomas, Laguna Niguel, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Division of Ser. No. 277,469, Jun. 25, 1981, Pat. No. 4,382,083.
This application Nov. 29, 1982, Ser. No. 460,091
Int. Cl.³ A61K 35/14
U.S. Cl. 424—101 3 Claims

1. A method for making a therapeutic composition, comprising

(a) providing a starting material comprising factors VII and IX;

(b) substantially separating factor VII from factor IX;

(c) activating the factor VII-enriched fraction from step (b) by

(i) selecting a condition which can be varied to control the degree of factor VII activation;

(ii) prior to the completion of activation, determining the magnitude of the condition needed to activate the factor VII to a predetermined degree of activation;

(iii) setting the condition to said magnitude;

(iv) conducting the activation of the factor VII in accordance with the condition; and

(v) terminating the activation at the predetermined degree of activation.

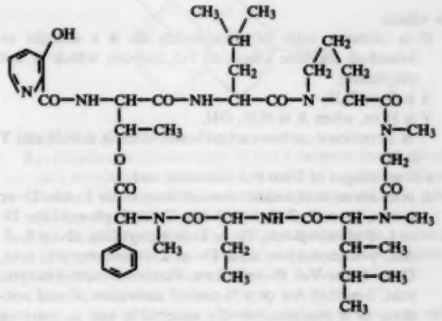
4,456,592

ANTIBIOTICS, NEOVIRIDOGRISEINS, AND THEIR METHOD OF PRODUCTION

Yasushi Okumura; Kazuhiko Okamura; Yasuo Fugakawa; Tomoyuki Ishikura, all of Kanagawa; Kageaki Kouno, Tokyo, all of Japan, and Joseph Lein, Fayetteville, N.Y., assignors to Sanraku-Ocean Co. and Panlabs Inc., both of Tokyo, Japan

Division of Ser. No. 803,922, Jun. 6, 1977, Pat. No. 4,355,112.
This application Dec. 23, 1981, Ser. No. 333,950
Int. Cl.³ A61K 37/00; C07C 103/52
U.S. Cl. 424—177 14 Claims

1. The antibiotic substance neoviridogrisein I of the formula



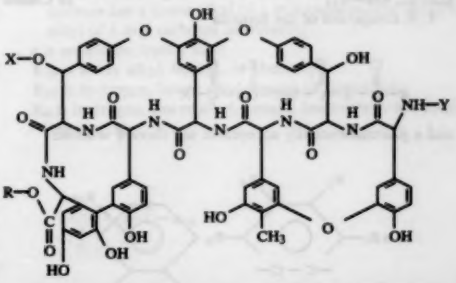
4,456,593

RISTOCETIN ψ-AGLYCONE AS AN ANTIBACTERIAL AGENT

Thomas R. Herrin, Waukegan, and Alford M. Thomas, Wadsworth, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Jun. 22, 1982, Ser. No. 391,079
Int. Cl.³ A61K 37/00; C07C 103/52
U.S. Cl. 424—177 6 Claims

1. A compound of the formula



wherein R is hydrogen or loweralkyl, X is hydrogen or ristosamine, and Y is acyl and pharmaceutically acceptable salts thereof.

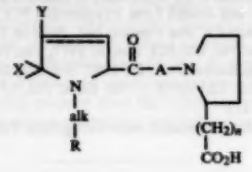
4,456,594

N-CARBOXYALKYLPROLINE-CONTAINING TRIPEPTIDES

Francis R. Pfeiffer, Cinnaminson, N.J., assignor to SmithKline Beckman Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 318,721, Nov. 6, 1981, abandoned. This application Oct. 21, 1982, Ser. No. 435,860
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 **12 Claims**

1. A chemical compound of the structural formula:



in which:

R is carboxy, sulfo or phosphono; alk is a straight or branched alkylene chain of 1-5 carbons which is not ethylidene;

X is O or H,H;

Y is H or, when X is H,H, OH;

is an optional carbon-carbon bond, when X is H,H and Y is H;

n is an integer of from 0-3 inclusive; and

A is an amino acid residue derived from D- or L-Ala, D- or L-Phe, D- or L-β-methyl-β-Ala, D- or L-phenyl-Gly, D- or L-β-phenyl-β-Ala, D- or L-β-thienyl-Gly, D- or L-β-Ala, γ-aminobutyric acid; D- or L-2-aminobutyric acid, D- or L-nor-Val, D- or L-Leu, 3-amino-3-methyl butyric acid, 2-methyl-Ala or a N-methyl derivative of said residues; or a pharmaceutically acceptable salt or prodrug derivative of said compound.

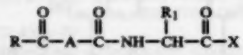
4,456,595

CARBOXY AND SUBSTITUTED CARBOXY AROLY PEPTIDES

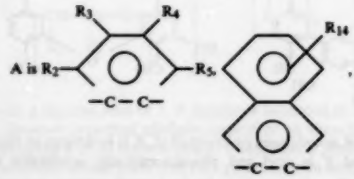
Harold N. Weller, III, and Eric M. Gordon, both of Pennington, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 6, 1982, Ser. No. 446,923
Int. Cl.³ A61K *37/00*; C07C *103/52*
U.S. Cl. 424—177 **18 Claims**

1. A compound of the formula



and a pharmaceutically acceptable salt thereof wherein



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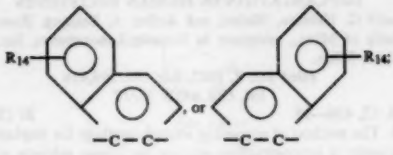
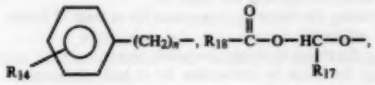
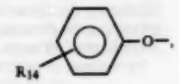
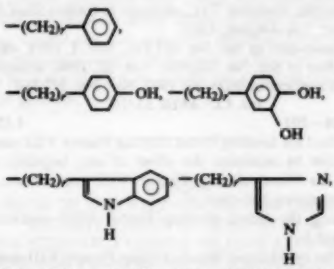


R is hydroxy, lower alkoxy, lower alkyl,

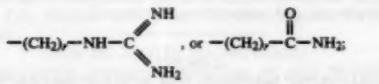




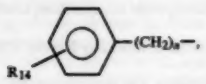
R_1 is hydrogen, lower alkyl, halo substituted lower alkyl,



$-(CH_2)_r-NH_2$, $-(CH_2)_r-SH$, $-(CH_2)_r-S-$lower alkyl, $-(CH_2)_r-S-$lower alkyl,

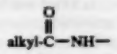


R_2, R_3, R_4 and R_5 are independently selected from the group consisting of hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons,

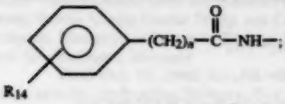


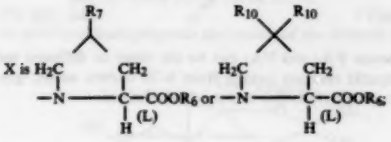
hydroxy, nitro, halo,

halo substituted lower alkyl of 1 to 4 carbons, hydroxy substituted lower alkyl of 1 to 4 carbons, lower

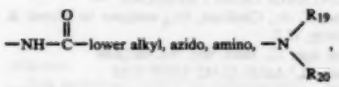


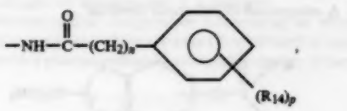
wherein said lower alkyl is of 1 to 4 carbons, and

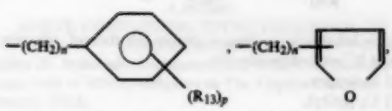


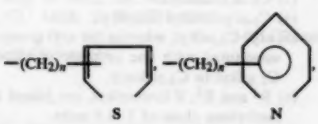


R_7 is hydrogen, lower alkyl, halogen, keto, hydroxy,

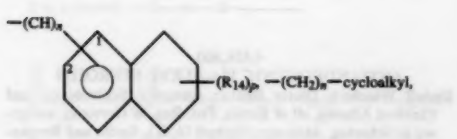


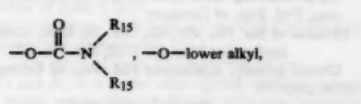


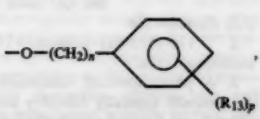




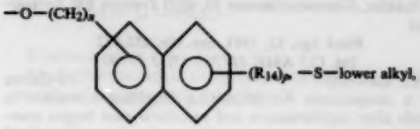
a 1- or 2-naphthyl of the formula

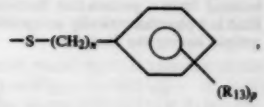






a 1- or 2-naphthyloxy of the formula





or a 1- or 2-naphthylthio of the formula

R_{10} is halogen or —Y—R_{16};

R_{13} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, hydroxy, phenyl, phenoxy, phenylthio, or phenylmethyl;

R_{14} is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, bromo, fluoro, trifluoromethyl, or hydroxy;

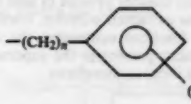
n is zero, one, two, three, or four;

p is one, two or three provided that p is more than one only if R_{13} or R_{14} is hydrogen, methyl, methoxy, chloro, or fluoro;

R_{15} is hydrogen or lower alkyl of 1 to 4 carbons;

Y is oxygen or sulfur;

R_{16} is lower alkyl of 1 to 4 carbons,



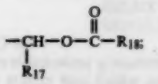
or the R_{16} groups join to complete an unsubstituted 5- or 6-membered ring or said ring in which one or more of the carbons has a lower alkyl of 1 to 4 carbons or a di(lower alkyl of 1 to 4 carbons) substituent;

r is an integer from 1 to 4;

R_{19} is lower alkyl, benzyl, or phenethyl;

R_{20} is hydrogen, lower alkyl, benzyl or phenethyl;

R_6 is hydrogen, lower alkyl, benzyl, benzhydryl, salt forming ion, or



R_{17} is hydrogen, lower alkyl, cycloalkyl of 3 to 7 carbons or phenyl;

R_{18} is hydrogen, lower alkyl, lower alkoxy or phenyl; and

M is a salt forming ion.

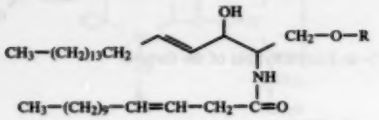
4,456,596

WOUND HEALING GLYCOSIDE COMPOSITIONS

Rolf Schäfer, Gravenmattstrasse 37, 4133 Pratteln BL, Switzerland

Filed Apr. 13, 1981, Ser. No. 253,872
Int. Cl.³ A61K 31/705; C07J 17/00
U.S. Cl. 424—180 16 Claims

8. A composition for promoting fibroblast formation in wounds after capillarization and vascularization begins comprising 5 to 50 micrograms per milliliter of a glycosphingolipid isolated from a protein-free fraction of mammalian tissue or fluid in a pharmaceutically acceptable carrier, said glycosphingolipid having the formula:



wherein R is an oligosaccharide containing 5 sugar units consisting of uronic acid, fucose and 3 modified and substituted hexoses.

4,456,597

INTERFERON INDUCER, A PROCESS FOR PRODUCING THE SAME AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Yasuhiko Kojima, Yokohama; Seishi Konno, Tokyo, and Takashi Hashimoto, Chofu, all of Japan, assignors to The Kitasato Institute, Tokyo, Japan

Continuation-in-part of Ser. No. 119,325, Feb. 7, 1980, abandoned. This application Aug. 6, 1981, Ser. No. 290,284
Claims priority, application Japan, Aug. 6, 1980, 55-107954
The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.
Int. Cl.³ A61K 31/69
U.S. Cl. 424—195 14 Claims

1. A process for producing a water-soluble interferon inducer from a plant tissue, comprising extracting said interferon inducer with water from the tissue of a plant belonging to the genus Carthamus containing said interferon inducer at a temperature of from ambient to the boiling point of the extraction mixture for a period of up to 5 days sufficient to extract the major portion of said interferon inducer present in said tissue, forming a supernatant from the extracted solution, fractionating the supernatant to yield fractions containing the major portion of said interferon inducer present in the supernatant, and recovering said interferon inducer therefrom.

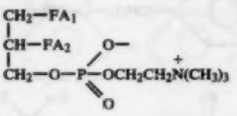
4,456,598

PROCESS AND COMPOSITION FOR TREATING DISORDERS BY ADMINISTERING A BUTYROPHENONE AND A CHOLINE

John H. Growdon, Brookline, and Richard J. Wurtman, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation of Ser. No. 229,893, Jan. 30, 1981, abandoned, which is a continuation-in-part of Ser. No. 126,124, Feb. 29, 1980, abandoned, which is a continuation-in-part of Ser. No. 88,227, Oct. 25, 1979, abandoned, which is a continuation of Ser. No. 847,967, Nov. 2, 1977, abandoned. This application May 3, 1982, Ser. No. 374,555
Int. Cl.³ A61K 31/685
U.S. Cl. 424—199 10 Claims

1. The process of reducing or eliminating undesirable effects of a drug administered to a human which side effects result from inadequate release of brain acetylcholine, said drug consisting of molindone, which comprises administering concomitantly with the drug an amount of a compound effective to release adequate amounts of brain acetylcholine selected from the group consisting of choline, a salt of choline, lysolecithin, an acyglycerophosphocoline, and to increase the choline level of a patient to between about 10 and 50 n moles/ml selected from the group consisting of choline, a salt of choline, lysolecithin, an acyglycerophosphocholine having the formula:



wherein FA_1 and FA_2 can be the same or different and are fattyacid residues having from 6-26 carbon atoms, glycerophosphatidyl choline and mixtures thereof.

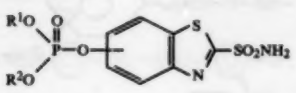
4,456,599

BENZOTHIAZOLESULFONAMIDE DERIVATIVES FOR THE TOPICAL TREATMENT OF ELEVATED INTRAOCULAR PRESSURE

Otto W. Woltersdorf, Jr., Chalfont, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 22, 1983, Ser. No. 487,634
Int. Cl.³ A61K 33/42; C07F 9/65
U.S. Cl. 424—200 14 Claims

1. A compound of structural formula:



or an ophthalmologically acceptable salt thereof, wherein:
R^1 and R^2 are independently:

(1) hydrogen,
(2) C_{1-18}alkyl,
(3) C_{3-6}cycloalkyl,
(4) C_{3-6}cycloalkyl-C_{1-3}alkyl,
(5) aryl-C_{1-3}alkyl, wherein the aryl group is unsubstituted or substituted with one or more of chloro, bromo, fluoro, C_{1-3}alkyl or C_{1-3}alkoxy,
(6) R^1 and R^2, if loweralkyl, are joined together to form a methylene chain of 3 to 6 units.

11. A method for treating glaucoma and ocular hypertension which comprises topically applying to an affected eye an effective intraocular pressure lowering amount of the compound of claim 1 or an ophthalmologically acceptable salt thereof.

4,456,600

ANTIANDROGENIC 17α-ALKYL STEROIDS

Rudolf Wiechert; Dieter Bittler; Annerose Schleusener, and Manfred Albring, all of Berlin, Fed. Rep. of Germany, assignors to Schering, Aktiengesellschaft (A.G.), Berlin and Bergkamen, Fed. Rep. of Germany

Division of Ser. No. 198,383, Oct. 20, 1980, abandoned. This application May 20, 1982, Ser. No. 380,328
Claims priority, application Fed. Rep. of Germany, Oct. 26, 1979, 2943776
Int. Cl.³ A61K 31/56
U.S. Cl. 424—238 6 Claims

1. 17β-Hydroxy-1α-methyl-17α-(1-methyl-n-propyl)-5α-androstan-3-one.

3. A pharmaceutical composition comprising an antiandrogenically topically effective amount of a composition of claim 1 and a pharmaceutically acceptable carrier for topical formulations.

4,456,601

3-CHLORO-PREGNANE DERIVATIVES AND A PROCESS FOR THE PREPARATION THEREOF

Jozsef Toth; Gyorgy Hajos; Gyorgy Fekete; Istvan Horvath; László Szporny; Anna Boor nee Mezei; Peter Aranyi; Aniko Naray; Sandor Gorog; Sandor Holly, and Csaba Molnar, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

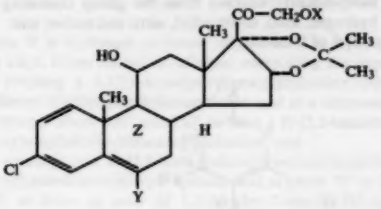
Filed Oct. 14, 1982, Ser. No. 434,335

Claims priority, application Hungary, Oct. 15, 1981, 2976/81

Int. Cl.³ C07J 71/00; A61K 31/56

U.S. Cl. 424—241 7 Claims

5. A $\Delta^{1,3,5}$-3-chloro-pregnane derivative of the formula (I)



(I)

wherein

X is hydrogen, acetyl or chloroacetyl,

Y is hydrogen or halogen, and Z is halogen.

6. A pharmaceutical composition comprising an effective amount of a compound of the formula (I) as defined in claim 5, together with a pharmaceutically acceptable carrier, diluent or additive.

4,456,602

AMINE CONTAINING ESTER PRODRUGS OF CORTICOSTEROIDS

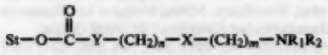
Bradley D. Anderson, Kalamazoo, and Robert A. Conradi, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 23, 1982, Ser. No. 410,282

Int. Cl.³ A61K 31/58; C07J 5/00

U.S. Cl. 424—243 15 Claims

1. A compound of the formula

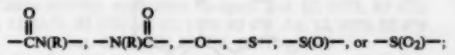


wherein

St is a corticosteroid absent the C-21 hydroxyl of said corticosteroid;

Y is a bound, —O— or —S—;

X is

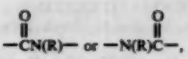


n is an integer of from 2 to 9;

m is an integer of from 1 to 5; with the proviso that the sum of m and n is not greater than 10;

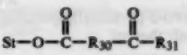
R is H or lower alkyl of from 1 to 4 carbon atoms;

each of R_1 and R_2 is a lower alkyl group of from 1 to 4 carbon atoms optionally substituted with one hydroxyl group, or R_1 and R_2 taken together with the nitrogen atom to which each is attached forms a monocyclic heterocyclic ring selected from pyrrolidino, piperidino, morpholino, thiomorpholino, piperazino, or N-(lower)alkyl piperazino; pharmaceutically acceptable addition salts and quaternary ammonium salts thereof with the proviso that when n is 2 or 3 and X is



R is lower alkyl.

12. A pharmaceutical composition comprising an effective quantity of a compound of the formula



wherein St is a corticosteroid absent the C-21 hydroxyl of said corticosteroid; R_{30} is $-(CH_2)_p-Z_1-(CH_2)_p-$ or $-Z_2-(CH_2)_p-$ wherein p is an integer of from 1 to 8, Z_1 is —O— or —S—, and Z_2 is a bound, —O— or —S—; and R_{31} is piperazino or N-(lower)alkylpiperazino; with the proviso that when Z_2 is a bond, p is other than the integer 1; pharmaceutically acceptable acid addition salts and quaternary ammonium salts thereof; as a sterile aqueous solution suitable for injection or infusion.

4,456,603

POLYPRENYLCARBOXYLIC ACID AMIDES USEFUL FOR TREATING LIVER DYSFUNCTION

Isao Yamatsu, Kawaguchi; Yuichi Inai; Shinya Abe, both of Tokyo; Hideaki Watanabe, Haguri; Toshiji Igarashi, Tokorozawa; Hiroyuki Shiojiri, Sayama; Yoshio Tanabe, Iruma, and Kumiko Hara, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

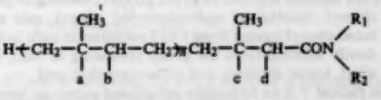
Filed Aug. 4, 1980, Ser. No. 175,213

Claims priority, application Japan, Aug. 14, 1979, 54-102747; Aug. 28, 1979, 54-108668

Int. Cl.³ A61K 31/445, 31/535

U.S. Cl. 424—248.57 10 Claims

1. A method for treating liver dysfunction which comprises, administering to a warm-blooded subject having liver dysfunction, a therapeutically effective amount of a pharmaceutical composition which comprises an effective amount of a compound having the formula:



wherein n is an integer of from 1 to 4, a and b are hydrogen or together signify a direct valence bond between the carbon atoms to which a and b are attached, c and d are hydrogen or together signify a direct valence bond between the carbon atoms to which c and d are attached, with the proviso that at least one of the pairs of (1) a, b and (2) c, d signifies a direct valence bond between the carbon atoms to which that pair is attached, and

is a 5- or 6-membered heterocyclic ring which may contain another hetero atom or be substituted, as an active ingredient, and at least one pharmaceutically acceptable inert carrier or diluent.

4,456,604

1-(3-HALO-2-PYRIDINYL) PIPERAZINE

Walfred S. Saari, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 362,081, Mar. 29, 1982, abandoned, which is a continuation-in-part of Ser. No. 267,120, May 26, 1981, abandoned. This application Jul. 12, 1982, Ser. No. 397,651

Int. Cl.³ C07D *401/04*; A61K *31/495*

U.S. Cl. 424—250 **3 Claims**

1. The compound 1-(3-fluoro-2-pyridinyl)piperazine or a pharmaceutically acceptable salt thereof.

4,456,605

HETEROCYCLIC DERIVATIVES OF [4-(PIPERAZIN-1-YL-PHENYLOXYMETHYL)-1,3-DIOXOLAN-2-YLMETHYL]-1H-IMIDAZOLES AND 1H-1,2,4-TRIAZOLES

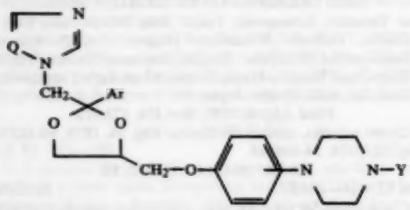
Jan Heeres, Vosselaar, and Robert Hendrickx, Beerse, both of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 261,420, May 7, 1981, Pat. No. 4,402,957, which is a division of Ser. No. 27,178, Apr. 4, 1979, Pat. No. 4,287,195, which is a continuation-in-part of Ser. No. 924,765, Jul. 14, 1978, abandoned. This application Jun. 30, 1983, Ser. No. 509,562

Int. Cl.³ C07D *419/14*; A61K *31/52*

U.S. Cl. 424—250 **2 Claims**

1. A chemical compound selected from the group consisting of an azole derivative having the formula:



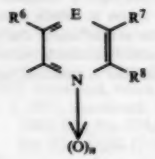
and the pharmaceutically acceptable acid addition salts and stereochemically isomeric forms thereof, wherein:

Q is a member selected from the group consisting of CH and N;

Ar is a member selected from the group consisting of phenyl, thienyl, halothienyl and substituted phenyl, said substituted phenyl having from 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy and trifluoromethyl; and

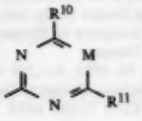
the radical Y is an optionally substituted mono- or binuclear nitrogen-containing heteroaromatic radical selected from the group consisting of:

a radical of formula


(c)

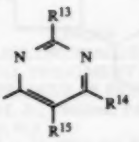
wherein n is the integer 0 or 1, E is a member selected from the group consisting of N and C—R^9 and R^6, R^7,R^8 and R^9 are each independently selected from the group consisting of hydrogen, halo, lower alkyl, lower alkyloxy, lower alkylthio, hydroxy, mercapto, nitro, amine and aminocarbonyl, or, R^7 and R^8, when taken together, represent a radical of the formula —CH=CH—CH=CH—;

a radical of formula


(d)

wherein M is a member selected from the group consisting of N and C—R^{12} and R^{10},R^{11} and said R^{12} are each independently selected from the group consisting of hydrogen, halo, lower alkyl, nitro and amino; and

a radical of formula


(e)

wherein R^{14} and R^{15} are each independently selected from the group consisting of hydrogen, halo, lower alkyl, lower alkyloxy, aryl and aryllower alkyl and R^{13} is selected from the group consisting of hydrogen, halo, amino, lower alkylthio, aryllower alkylthio and lower alkyloxy.

4,456,606

SUBSTITUTED NAPHTHO[ij]QUINOLIZINES

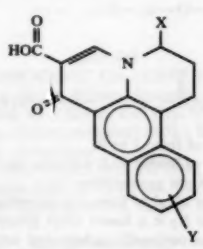
John F. Gerster, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed May 10, 1982, Ser. No. 376,540

Int. Cl.³ C07D *471/04*

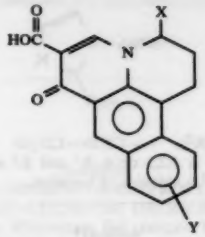
U.S. Cl. 424—258 **11 Claims**

1. A compound of the formula



wherein X is hydrogen or lower alkyl and Y is hydrogen, lower alkyl, lower alkoxy or halogen; or a lower alkyl ester, acyl chloride or pharmaceutically-acceptable carboxylate salt thereof.

8. A process for the preparation of an ester of a compound of the formula:

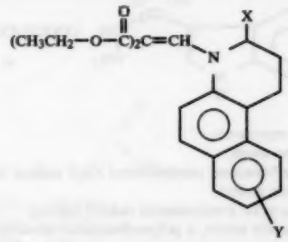


wherein X is hydrogen or lower alkyl and Y is hydrogen, lower alkyl, lower alkoxy or halogen; comprising the steps of

(1) reacting a 1,2,3,4-tetrahydrobenzo[f]quinoline with a diester of ethoxymethylenemalonic acid at a temperature between about 100° and 250° to form a N-(2,2-biscarbalkoxy)vinyltetrahydrobenzo[f]quinoline, and

(2) reacting said N-(2,2-biscarbalkoxy)vinyltetrahydrobenzo[f]quinoline in polyphosphoric acid at about 70° to 140° C. to form an ester of 1,2-dihydro-7-oxo-3H,5H-naphtho[1,2,3-ij]-quinolizine-6-carboxylic acid.

11. The compound of the formula:



wherein X is hydrogen or lower alkyl and Y is hydrogen, lower alkyl, lower alkoxy or halogen.

4,456,607

9-BROMO-HEXAHYDRO- AND OCTAHYDRO-INDOLO[2,3 A]QUINOLIZINES AND USE FOR INCREASING BLOOD CIRCULATION

Csaba Szántay; Lajos Szabó; György Kalaus; Lajos Dancsi; Tibor Keve; Egon Kárpáti, and László Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

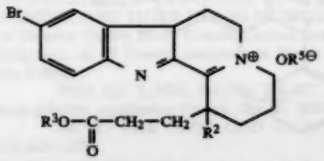
Division of Ser. No. 056,395, Jul. 10, 1979, Pat. No. 4,315,011. This application Jun. 2, 1981, Ser. No. 269,722

Claims priority, application Hungary, Jul. 12, 1978, RI 672; Jul. 12, 1978, RI 673; Jul. 12, 1978, RI 674; Jul. 12, 1978, RI 675

Int. Cl.³ A61K *31/475;* **C07D** *459/00*

U.S. Cl. 424—262 **14 Claims**

1. A pharmaceutically acceptable 1alkyl-1-alkoxycarbonylethyl-9-bromo-hexahydro-indolo-quinolizinium alkoxide of the formula XIIIa

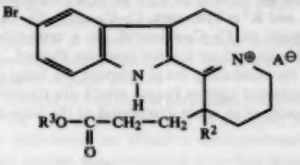


XIIIa

wherein R^2, R^3 and R^5 are each C_1 to C_6 alkyl.

4. A method of increasing blood circulation and decreasing blood flow resistance in the extremities of an animal subject while maintaining an almost unchanged pulse rate and a slightly lower blood pressure which comprises the step of administering the said animal subject a pharmaceutically effective amount of the pharmaceutically acceptable alkoxide of the formula XIIIa as defined in claim 1.

5. A pharmaceutically acceptable acid addition salt of the formula XIIIb

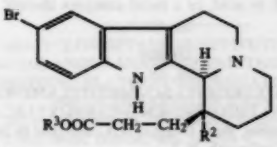


XIIIb

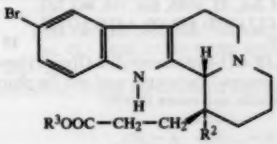
wherein R^2 and R^3 are each C_1 to C_6 alkyl, and A^- is the anion of a pharmaceutically acceptable acid.

9. A method of increasing blood circulation and decreasing blood flow resistance in the extremities of an animal subject while maintaining an almost unchanged pulse rate and a slightly lower blood pressure, which comprises the steps of administering to said animal subject a pharmaceutically effective amount of the pharmaceutically acceptable acid addition salt defined in claim 5.

10. A compound of the formula XIVa or XIVb



(XIVa)



(XIVb)

wherein R^2 and R^3 are each C_1 to C_6 alkyl, or a pharmaceutically acceptable acid addition salt thereof.

4,456,608

AZOLE COMPOUNDS, THEIR PREPARATION, AND FUNGICIDES WHICH CONTAIN THESE COMPOUNDS

Hubert Sauter, Mannheim; Eberhard Ammermann, Ludwigshafen; Costin Rentzea, Heidelberg, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

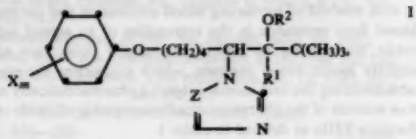
Filed Jun. 30, 1982, Ser. No. 393,763

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1981, 3126022

Int. Cl.³ A01N *43/50, 43/64;* **C07D** *233/60, 249/08*

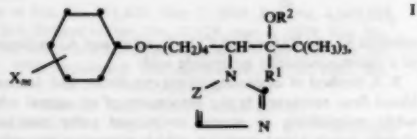
U.S. Cl. 424—269 **2 Claims**

1. An azole compound of the formula



where X is hydrogen, halogen or trifluoromethyl, m is an integer from 1 to 5, and, if m is greater than 1, the X's can be identical or different, Z is N or CH, R^1 is C_2–C_4-alkenyl or C_2–C_4-alkynyl, and R^2 is hydrogen, C_1–C_4-alkyl, C_2–C_4-alkenyl, C_2–C_4-alkynyl or C_2–C_4-alkanoyl, or a crop-tolerated addition salt with an acid, or a metal complex thereof.

2. A process for combating fungi, wherein the fungi or the objects to be protected against fungus attack are treated with an effective amount of an azole compound of the formula



where X is hydrogen, halogen or trifluoromethyl, m is an integer from 1 to 5, and, if m is greater than 1, the X's can be identical or different, Z is N or CH, R^1 is C_2–C_4-alkenyl or C_2–C_4-alkynyl, and R^2 is hydrogen, C_1–C_4-alkyl, C_2–C_4-alkenyl, C_2–C_4-alkynyl or C_2–C_4-alkanoyl, or a crop-tolerated addition salt with an acid, or a metal complex thereof.

4,456,609

(5R, 6S, 8R-6-(1-HYDROXYETHYL)-2-(2-[METHYLAMINOCARBONYL]-ETHYLTHIO)-PENEM-3-CARBOXYLIC ACID

Stuart W. McCombie, West Orange, N.J., assignor to Schering Corporation, Kenilworth, N.J.

Filed Jan. 31, 1983, Ser. No. 462,723

Int. Cl.³ C07D *499/00*; A61K *31/425*

U.S. Cl. 424—270 **15 Claims**

1. 5R,6S,8R-6-(1-hydroxyethyl)-2-(2[methylaminocarbonyl]-ethylthio)-penem-3-carboxylic acid and the pharmaceutically acceptable salts and esters thereof.

4,456,610

FILARICIDAL 2-NITROIMIDAZOLES

Werner Hofheinz, Bottmingen, and Harro Stohler, Binningen, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.Y.

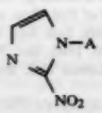
Division of Ser. No. 263,612, May 14, 1981, Pat. No. 4,366,166. This application Sep. 23, 1982, Ser. No. 421,924

Claims priority, application Switzerland, May 23, 1980, 4057/80

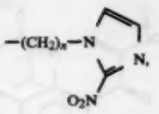
Int. Cl.³ A61K *31/415*; C07D *233/91*

U.S. Cl. 424—273 R **6 Claims**

5. A pharmaceutical composition for the treatment of filariasis comprising a therapeutically inert carrier and a therapeutically effective amount of a compound of the formula



wherein A is one of the groups



—$C(R^3)$—$C(R^1)(R^2)$, —CHBr—CH_2Br or —CH_2—CCl=CH_2; n is 1,2,3 or 4; R^1 and R^2 are hydrogen or C_{1-3}-alkyl and R^3 is chlorine or bromine.

4,456,611

DERIVATIVES OF 2-[3-(3-INDOLY)2-AMINO PROPIONYLOXY] ACETIC ACID, AND SERITONING INCREASING USE THEREOF

Claude Larnelle, Villeneuve Loubet, and Marcel Lepant, Vence, both of France, assignors to Laboratoires Panmedica, Carros, France

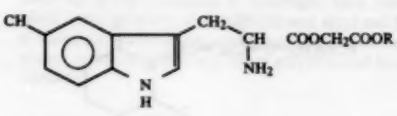
Filed Jan. 26, 1982, Ser. No. 342,929

Claims priority, application France, Feb. 2, 1981, 81 01931

Int. Cl.³ A61K *31/405*; C07D *209/28*

U.S. Cl. 424—274 **7 Claims**

1. A compound in DL or L configuration corresponding to the following formula I:



in which R represents:

a hydrogen atom,

a linear or branched unsubstituted alkyl radical having 1 to 12 carbon atoms,

polycarbocyclic unsubstituted radical having 5 to 16 carbon atoms, a polycarbocyclic unsubstituted radical of 5–16 carbons linked by a methylene radical, or a pharmaceutical acceptable addition salt thereof.

7. A method for treating animals to increase the serotonin content of the brain, comprising administering an amount sufficient to increase serotonin content in the brain of a compound in accordance with claim 1.

4,456,612

BENZISOXAZOLE CARBOXYLIC ACIDS

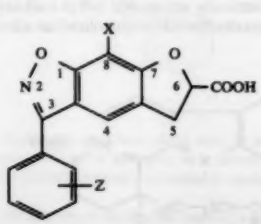
Jacob J. Plattner, Libertyville, and Anthony K. Fung, Waukegan, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 300,361, Sep. 8, 1981. This application Feb. 23, 1983, Ser. No. 469,059

Int. Cl.³ C07D *261/20*, *261/00*; A61K *31/42*

U.S. Cl. 424—272 **16 Claims**

1. A compound of the formula



wherein X is hydrogen, loweralkyl, halo, loweralkoxy or

trifluoro-methyl, and Z is hydrogen, loweralkyl, halo, hydroxy or alkoxy, or pharmaceutically acceptable salts thereof.

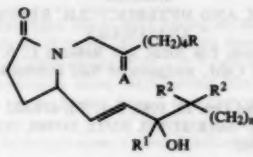
4,456,613

6-KETO- AND 6-HYDROXY-8-AZAPROSTANOIDS AND ANTI-ULCER USE THEREOF

Chia-Lin J. Wang, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

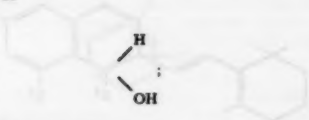
Filed Dec. 27, 1982, Ser. No. 452,883
Int. Cl.³ A61K *31/40*; C07D *207/27*
U.S. Cl. 424—274 22 Claims

1. A compound of the formula:



wherein

A is =O or



R is CO_2R^4 or CH_2OH;

R^1 is H, CH_3, or C_2H_5;

R^2 is H, CH_3, or F;

R^3 is CH_3 or CF_3;

R^4 is H, C_1 to C_{12} n-alkyl, branched chain alkyl, or cycloalkyl, or a physiologically acceptable metal or amine salt cation; and

n is an integer from 3 to 8.

21. A pharmaceutical composition having cytoprotective activity comprising an effective amount of a compound according to claim 1 with a pharmaceutically acceptable carrier.

22. A method for preventing or treating ulcers in a human or an animal which comprises administering an effective amount of a pharmaceutical composition according to claim 21.

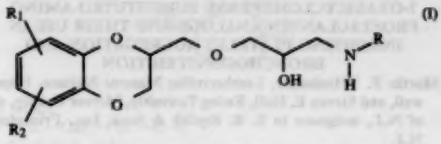
4,456,614

3-AMINO-1-[(1,4-BENZODIOXAN)-2-YL-METHOXY]-2-PROPANOLS, PHARMACEUTICAL COMPOSITIONS THEREOF, AND THEIR USE AS MEDICAMENTS

Gilbert Mouzin, Castre; Henri Cousse, Castres, and Pol Vilain, Labruguiere, all of France, assignors to Pierre Fabre S.A., Paris, France

Filed Apr. 2, 1981, Ser. No. 250,407
Claims priority, application France, Apr. 4, 1980, 80 07719
Int. Cl.³ A61K *31/335*; C07D *319/14*
U.S. Cl. 424—278 7 Claims

1. A compound of formula I:



(I)

in which:

R_1 and R_2 may be identical or different and represent a hydrogen or halogen atom or a lower alkyl, lower alkoxy, nitro or acetyl group, and

R represents a lower alkyl or lower aralkyl group, or a pharmaceutically acceptable salt thereof with an inorganic or organic acid.

4. A method of treating hypertension and arrhythmia comprising the step of administering to a subject suffering from such a disturbance an effective antihypertensive or antiarrhythmic amount of a compound according to any of claims 1, 2 or 3.

5. A pharmaceutical composition, suitable for use as an antihypertensive or antiarrhythmic agent, characterized by the fact that it contains, as active principle, an effective antihypertensive or antiarrhythmic amount of at least one compound of any of claims 1, 2 or 3, together with a pharmaceutically-acceptable vehicle or carrier therefor.

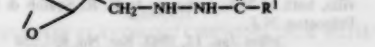
4,456,615

7-OXABICYCLOHEPTANE SUBSTITUTED AMINO PROSTAGLANDIN ANALOGS AND THEIR USE IN INHIBITING PLATELET AGGREGATION AND BRONCHOCONSTRICTION

Masami Nakane, Plainsboro, N.J.; David L. Snitman, Boulder, Colo.; Joyce Reid, Dayton, and Martin F. Haslanger, Lambertville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 25, 1982, Ser. No. 436,741
Int. Cl.³ A61K *31/34*; C07D *307/00*
U.S. Cl. 424—285 13 Claims

1. A compound having the structural formula



and including all stereoisomers thereof;

wherein A is CH=C or $(CH_2)_2$;

m is 1 to 8; R is H or lower alkyl; and R^1 is lower alkyl, lower alkoxy, aryl, aralkyl, aralkoxy, alkylamino, arylamino or aralkylamino, wherein the term alkyl or lower alkyl by itself or as part of another group contains 1 to 12 carbons, the term aryl by itself or as part of another group refers to a monocyclic or bicyclic aromatic group which contains 6 to 10 carbon atoms in the ring and which ring may be unsubstituted or substituted with a halogen, lower alkyl or lower alkoxy group.

9. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

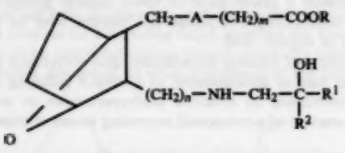
4,456,616

7-OXABICYCLOHEPTANE SUBSTITUTED AMINO PROSTAGLANDIN ANALOGS AND THEIR USE IN INHIBITING PLATELET AGGREGATION AND BRONCHOCONSTRICTION

Martin F. YHaslanger, Lambertville; Masami Nakane, Hopewell, and Steven E. Hall, Ewing Township, Mercer County, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Dec. 27, 1982, Ser. No. 453,849
Int. Cl.³ A61K *31/34*; C07D *307/00*
U.S. Cl. 424—285 13 Claims

1. A compound having the structural formula



I

and including all stereoisomers thereof;
wherein A is —CH=CH— or —$(CH_2)_2$—;
m is 1 to 8; n is 0 to 5;
R is hydrogen or lower alkyl;
R^1 and R^2 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, aryl, aralkyl, cycloalkyl, cycloalkylalkyl and —CH_2—X—R^3 wherein X is O or S and R^3 is lower alkyl, aryl or aralkyl, with the proviso that at least one of R^1 and R^2 is other than hydrogen, wherein the term alkyl or lower alkyl by itself or as part of another group contains 1 to 12 carbons, the term aryl by itself or as part of another group is phenyl or naphthyl and which may be unsubstituted or substituted with a halogen, lower alkyl or lower alkoxy group, and the term cycloalkyl by itself or as part of another group contains 3 to 12 carbon atoms in the ring and may be unsubstituted or substituted with 1 or 2 lower alkyl groups and/or lower alkoxy groups.

8. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

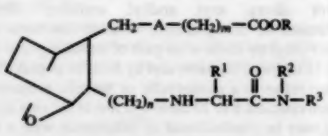
4,456,617

7-OXABICYCLOHEPTANE SUBSTITUTED AMINO PROSTAGLANDIN ANALOGS AND THEIR USE IN INHIBITING PLATELET AGGREGATION AND BRONCHOCONSTRICTION

Masami Nakane, Hopewell, and Martin F. Haslanger, Lambertville, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 12, 1983, Ser. No. 457,538
Int. Cl.³ A61K *31/34*; C07D *307/00*
U.S. Cl. 424—285 13 Claims

1. A compound having the structural formula



and including all stereoisomers thereof; wherein
A is —CH=CH— or —$(CH_2)_2$—;
m is 1 to 8; n is 1 to 5;
R is hydrogen or lower alkyl;
R^1 is hydrogen, lower alkyl, aralkyl, hydroxyalkyl or aryl;
R^2 and R^3 are the same or different and are selected from the group consisting of hydrogen, lower alkyl, aryl, aralkyl, cycloalkyl and cycloalkylalkyl, with the proviso that at least one of R^2 and R^3 is other than hydrogen; and wherein the term alkyl or lower alkyl by itself or as part of another group contains 1 to 12 carbons, the term aryl by itself or as part of another group is phenyl or naphthyl and which ring may be unsubstituted or substituted with a halogen, lower alkyl or lower alkoxy group, and the term cycloalkyl by itself or as part of another group contains 3 to 12 carbons and which may be unsubstituted or substituted with 1 or 2 halogens, 1 or 2 lower alkyl groups and/or lower alkoxy groups.

8. A method of inhibiting arachidonic acid-induced platelet aggregation and bronchoconstriction, which comprises administering to the circulatory system of a mammalian host an effective amount of a compound as defined in claim 1 or a pharmaceutically acceptable salt thereof.

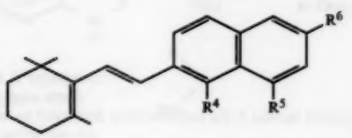
4,456,618

NAPHTHENIC AND HETEROCYCLIC RETINOIC ACID ANALOGUES

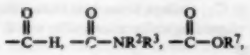
Marcia I. Dawson, Los Altos, and Rebecca L. S. Chan, Palo Alto, both of Calif., assignors to SRI International, Menlo Park, Calif.

Filed Oct. 15, 1982, Ser. No. 434,622
Int. Cl.³ A61K *31/075, 31/11, 31/165, 31/19*
U.S. Cl. 424—308 20 Claims

1. A compound of the formula:



where R^4 and R^5 are independently hydrogen, fluorine, methyl, or methoxy, and R^6 is



or —$CH(OR^8)_2$
where R^2 is hydrogen, alkyl, or aryl, R^3 is alkyl or aryl, R^7 is hydrogen, alkyl or aryl, and R^8 is alkyl or aryl.

9. A method of inhibiting tumor promotion in epithelial cells of a living animal comprising administering a tumor promotion inhibiting amount of the compound of claim 1 to the animal.

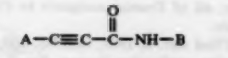
4,456,619

AMIDES OF 2-ALKYNOIC ACIDS AND USE FOR INHIBITING ACCUMULATION OF CHOLESTEROL ESTER IN ARTERIAL WALLS

Faizulla G. Kathawala, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 943,340, Sep. 18, 1978, abandoned. This application Sep. 17, 1979, Ser. No. 76,460
Int. Cl.³ C07C *103/133, 103/737*; A61K *31/16*
U.S. Cl. 424—324 31 Claims

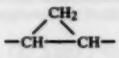
1. A compound of the formula:



wherein A is of
type a) an alkyl radical having from 1 to 23 carbon atoms;
type b) an alkenyl or alk-(poly)en-yl radical having from 7 to

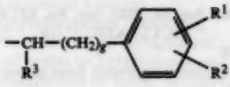
23 carbon atoms and from 1 to 4 ethylenically unsaturated positions; or

type c) a saturated hydrocarbon chain having from 7 to 23 carbon atoms and 1 to 4 cyclopropanyl groups of the formula



and B is of:

type a) an aralkyl radical of the structure



wherein g is 0 or 1;

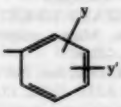
wherein

R^1 is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms; or alkyl having from 1 to 3 carbon atoms;

R^2 is a hydrogen atom, alkyl having from 1 to 3 carbon atoms, alkoxy having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; and

R^3 is i) a hydrogen atom, a phenyl radical of the structure ii)

(ii)



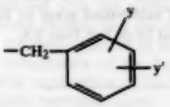
wherein

y is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms; and

y′ is a hydrogen atom, alkoxy having from 1 to 3 carbon atoms, alkyl having from 1 to 3 carbon atoms, or halo having an atomic weight of from about 19 to 36; or of

subtype iii, a benzyl radical of the formula

(iii)



wherein

y and y′ are as defined above; or subtype iv) alkyl having from 1 to 8 carbon atoms;

type b) a phenyl radical of the structure of:

wherein

R^2 is as defined above, and

R^* is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkyl having from 1 to 3 carbon atoms; alkoxy having from 1 to 3 carbon atoms; or

a radical of the structure R′:

in which

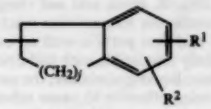
D is $-CH_2-$ or $-O-$;

f is 0 or 1; and

Q is a hydrogen atom, halo having an atomic weight of from about 19 to 80, alkoxy having from 1 to 3 carbon atoms, or alkyl having from 1 to 3 carbon atoms;

or

type c) a benzocycloalkyl nucleus of the structure:



wherein

R^1 and R^2 are as defined above; and

j is a whole integer of from 1 to 4.

28. A method of inhibiting the accumulation of cholesterol ester in the arterial wall of a mammal in need of such treatment, comprising administering an amount of a compound of claim **1** to said mammal effective in inhibiting the accumulation of cholesterol ester in the arterial walls of said mammal.

4,456,620

D-HOMO-4,17-ANDROSTADIEN-3-ONE, ITS PREPARATION AND PHARMACEUTICAL USE

Henry Laurent, and Rudolf Wiechert, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Apr. 13, 1982, Ser. No. 367,866

Claims priority, application Fed. Rep. of Germany, Apr. 13, 1981, 3115995

Int. Cl.³ A01N *35/00*

U.S. Cl. 424—331 **1 Claim**

1. A method of treating acne, seborrhea, alopecia or hirsutism in a patient comprising administering an antiandrogenically effective amount of a topically administerable pharmaceutical composition comprising an antiandrogenically effective amount of D-homo-4,17-androstadien-3-one and a pharmaceutically acceptable carrier which is suitable for topical administration, and wherein the concentration of D-homo-4,17-androstadien-3-one is 0.5–5.0 wt. %.

4,456,621

PROCESS FOR FLAVORING CHEWING GUM WITH STABILIZED PEPPERMINT OIL

Bernie Blackwell, Laurelton, N.Y.; Shelley Netherwood, Brea, Calif., and Dominick J. Piccolo, Brooklyn, N.Y., assignors to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 450,870, Dec. 20, 1982, Pat. No. 4,440,790. This application Jan. 13, 1984, Ser. No. 570,473

Int. Cl.³ A23L *1/221, 1/226*

U.S. Cl. 426—3 **15 Claims**

1. A method of flavoring chewing gum which comprises adding thereto an effective amount of stabilized peppermint oil flavoring agent prepared by reacting the peppermint oil with about 0.5% to about 15% by weight maleic anhydride, based on the weight of peppermint oil to selectively form a menthofuran-maleic anhydride adduct without otherwise affecting the flavoring agent properties of the remaining peppermint oil constituents and recovering peppermint oil having a reduced menthofuran content.

4,456,622

COMBINATION SEMI-CONTINUOUS AND BATCH PROCESS FOR PREPARATION OF VINEGAR

John A. Maselli, Wilton, and Robert O. Horwath, Westport, both of Conn., assignors to Nabisco Brands, Inc., Parsippany, N.J.

Filed Dec. 6, 1982, Ser. No. 447,047
Int. Cl.³ C12J 1/00; C12P 7/54
U.S. Cl. 426—17 17 Claims

1. A process of producing vinegar by the aerobic bacterial fermentation of ethanol to provide a liquid product comprising at least about 18% acetic acid, which comprises: p1 (a) subjecting a mixture comprisin ethanol, nutrients and vinegar bacteria to aerobic ferment on in at least two semi-continuous fermentation reactors under operating conditions effective to provide a liquid comprising about 10 to about 12% acetic acid,

(b) removing a first portion of the fermentation mixture comprising ethanol, acetic acid and vinegar bacteria from each semi-continuous fermentation reactor,

(c) combining said first portion with an oxygen-containing gas substantially immiscible with said first portion producing a two phase liquid-gas mixture, the nature and quantity of said gas being effective to cause substantially more of the alcohol and acetic acid in said first portion to pass in tangential flow fashion through a filter membrane as the filtrate thereof, than if said portion were subjected to substantially the same conditions in the absence of said gas,

(d) subjecting said two phase liquid-gas mixture to tangential flow membrane filtration effective to separate said first portion into a second portion of alcohol and acetic acid and a concentrate of substantially all of the vinegar bacteria and a remaining portion of ethanol and acetic acid, said filter membrane having a porosity of less than 0.5 μm,

(e) recovering said second portion as a vinegar product comprising about 10 to about 12% acetic acid.

(f) passing part of said concentrate to a batch fermentation reactor,

(g) adding a feed mixture comprising ethanol and nutrients to said batch fermentation reactor in an amount effective to provide, together with said part of said concentrate of step (f), a fermentable mixture,

(h) subjecting the mixture in said batch reactor to aerobic fermentation under batch operating conditions effective to provide a liquid comprising about 18 to about 20% acetic acid, said operating conditions including a temperature substantially lower than that employed in the semi-continuous fermentation of step (a),

(i) subjecting said mixture in said batch reactor of step (h) to filtration to provide a vinegar product comprising about 18 to about 20% acetic acid, and

(j) after removing said first portion in step (b), adding a further feed mixture comprising ethanol and nutrients to each said semi-continuous fermentation reactor in an amount effective to provide, together with the portion of said mixture of step (a) remaining after said first portion is removed from each semi-continuous fermentation reactor, a fermentable mixture under the operating conditions employed in each semi-continuous fermentation reactor.

4,456,623

RUMINANT ANIMAL FEED AND METHOD OF MAKING SAME

John A. Dika, Kewaunee, and Fredrick W. Juengst, Jr., Green Bay, both of Wis., assignors to Calor Agriculture Research, Inc., Kewaunee, Wis.

Filed Mar. 30, 1983, Ser. No. 480,234
The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.
Int. Cl.³ A23K 1/22
U.S. Cl. 426—69 4 Claims

1. A process for the manufacture of a dried calcium ammonium lactate product which comprises forming a mixture of calcium ammonium lactate sediment said sediment containing calcium ammonium lactate in mixture with fermented ammonated condensed whey and an amount of calcium sulfate effective to produce said dried product and drying the mixture in contact with air at a temperature below 40° C.

4,456,624

PROCESS FOR MAKING FRENCH FRIED POTATOES

Jerome J. Glantz, Tualatin, and Michael G. Doenges, Newberg, both of Oreg., assignors to Lamb-Weston, Inc., Portland, Oreg.

Filed Jan. 14, 1983, Ser. No. 457,911
Int. Cl.³ A23L 1/216
U.S. Cl. 426—96 31 Claims

1. A method of preparing french fried potato strips comprising the steps of:

cutting raw potatoes into strips; and

impinging a stream of food particles upon the strips at a velocity sufficient to embed such particles in an outer cellular surface layer of the strips and disrupt the outer cellular surface tissue of the strips without destroying the structural integrity of the strips.

4,456,625

STORAGE STABLE, READY-TO-EAT BAKED GOODS

Jack R. Durst, Champlin, Minn., assignor to The Pillsbury Company, Minneapolis, Minn.

Filed Jun. 14, 1982, Ser. No. 388,069
Int. Cl.³ A21D 10/02, 13/00
U.S. Cl. 426—106 26 Claims

1. A lower moisture, storage stable, crumb-structured, ready-to-eat, baked good which contains at least 80% of starch in ungelatinized form, said baked good being made from a flour containing base batter or dough mix, water and at least 5% by weight of said product of a liquid edible polyhydric alcohol, said baked good comprising:

having a water activity level (Aw) of said baked good equal to or less than 0.85,

the ratio of total water of said baked good to liquid polyhydric alcohol being equal to or less than 4.8, and

the ratio of flour of said baked good to liquid polyhydric alcohol being equal to or less than 5.6.

4,456,626

NEW SHORTENING SYSTEM

Kenneth W. Nelson; Ricky A. Woo; Patrick D. Palumbo, and Michael L. Collins, all of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 359,013, Mar. 17, 1982, abandoned. This application Oct. 25, 1982, Ser. No. 436,755
Int. Cl.³ A21D 10/00, 10/04, 13/08; A23D 5/00
U.S. Cl. 426—553 19 Claims

1. A shortening system comprising:

(1) from about 13% to about 35% of an emulsifier consisting essentially of hydrophilic polyglycerol esters having an average of 4 to 9 glycerol units per polyglycerol moiety and from about 3% to about 13% polyol and propylene glycol monoesters in a ratio of polyglycerol ester to propylene glycol ester of from 1:2 to about 1:7;

(2) from about 65% to about 80% of fat, oil or mixtures thereof.

4,456,627

POLYGLYCEROL ESTERS

Jan Van Heteren; Cornelis Poot, both of Vlaardingen; Freek Reckweg, Rotterdam, all of Netherlands, and Murray F. Stewart, Bedford, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Jul. 12, 1982, Ser. No. 397,279

Claims priority, application Netherlands, Jul. 15, 1981, 8103356

Int. Cl.³ A23D 3/00, 5/00

U.S. Cl. 426—603 5 Claims

1. A margarine fat or fat blend having a reduced tendency to develop graininess, comprising:

(i) 0.1 to 10 wt% of polyglycerol fatty acid esters having the following structural features:

(a) a polyglycerol moiety comprising
50–100% of di-, tri- or tetraglycerol,
0–40% of penta- or hexaglycerol, and
0–10% of hexaglycerol or higher polymers;

(b) fatty acid residues selected from those having 18 and 16 carbon atoms and mixtures thereof, having an iodine value that does not exceed 10;

(c) a degree of esterification ranging from 80 to 100%; and

(ii) 99.9 to 90 wt% of a fat or fat blend which upon storage will develop a perceivable graininess.

4,456,628

PROCESS FOR FILM-COATING A PARTICULATE SOLID, AND EMULSIONS FOR CONDUCTING THE PROCESS

Kurt H. Bauer, Im Finkeler 4, D-7800 Freiburg 33, and Hermann Osterwald, Blucherstr. 16, D-7800 Freiburg, both of Fed. Rep. of Germany

Filed Jan. 7, 1981, Ser. No. 223,157

Int. Cl.³ A61K 9/30, 9/36

U.S. Cl. 427—3 4 Claims

1. In the film-coating of a particulate medicinal agent including the steps of applying to said particulate medicinal agent a liquid composition containing a water-insoluble film-forming agent in a solvent therefor and thereafter drying off the liquid constituents of said liquid composition thereby to form a film on said particulate medicinal agent:

the improvement wherein said liquid composition is an emulsion including, by weight: (1) about 10–70% lipophilic solvent; (2) about 5–40% hydrophilic solvent; and (3) about 20–70% water; said emulsion comprising two phases, one of said phases containing the major portion of said lipophilic solvent with the water-insoluble film forming agent dissolved therein, and the other of the said phases containing the major portion of said hydrophilic solvent, the liquid components of the liquid composition being removed after application of said liquid composition to said particulate medicinal agent.

4,456,629

POWDERED WAX, TABLET COATED THEREWITH AND METHOD

Thomas G. Wood, East Brunswick, and Steven M. Oblack, South Plainfield, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jul. 12, 1982, Ser. No. 397,635

Int. Cl.³ A61K 9/38

U.S. Cl. 427—3 4 Claims

1. A method for forming a sugar coated tablet having durable print thereon, which comprises milling frozen pieces of wax and dry ice to form a snow like mixture, allowing the dry ice to evaporate from the mixture while maintaining the mixture at a temperature of less than about 5° C. to form a dry powered wax which is substantially free of clumps, and having an average particle size of less than 100 microns, applying said dry powdered wax which comprises a wax selected from the group consisting of white wax, carnauba wax and mixtures thereof, on said sugar-coated tablet to form a shiny wax coating and printing over the shiny wax coated tablet.

4,456,630

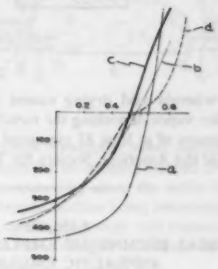
METHOD OF FORMING OHMIC CONTACTS

Bulent M. Basol, Los Angeles, Calif., assignor to Monosolar, Inc., Inglewood, Calif.

Filed Aug. 18, 1983, Ser. No. 524,411

Int. Cl.³ B05D 5/12; B44C 1/22; C03C 15/00, 25/06

U.S. Cl. 427—88 8 Claims



1. A method of forming ohmic contacts with thin film of a p-type semiconductor compound formed of at least one of the metal elements of Class II B of the Periodic Table of Elements and one of the non-metal elements of Class VI A of the Periodic Table of Elements comprising:

(a) etching the surface of said film with an acidic solution to form a non-metal-rich surface;

(b) treating the surface of the acid etched film with a strong basic solution; and

(c) then depositing on said etched and treated surface a conductive metal layer.

4,456,631

ELECTRONICALLY CONDUCTIVE LITHIA DOPED OXIDE CERAMICS FOR USE IN SODIUM SULFUR BATTERIES

Gary M. Crosbie, Dearborn; Gerald J. Tennenhouse, Southfield; Ragnar P. Tischer, Birmingham, and Halina S. Wroblowa, West Bloomfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 19, 1983, Ser. No. 503,201

Int. Cl.³ H01M 10/39

U.S. Cl. 429—104 17 Claims

1. An electrically conductive ceramic material suitable for use at high temperatures and in the presence of corrosive environments, characterized in that said conductive ceramic material comprises chromium oxide (Cr_2O_3) doped with at least 0.02 mole percent lithium oxide based on moles of said chromium oxide, wherein said chromium oxide contains less than about 0.5 mole percent of any impurity selected from the group consisting of sodium oxide and potassium oxide, based on moles of said chromium oxide.

4,456,632

WHITE ELECTROSENSITIVE PAPER

Suresh D. Amberkar, Maharashtra, India, assignor to Dennison Manufacturing Company, Framingham, Mass.

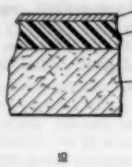
Continuation-in-part of Ser. No. 200,662, Oct. 27, 1980, abandoned. This application Dec. 16, 1982, Ser. No. 450,164

Int. Cl.¹ B32B 31/00, 3/00

U.S. Cl. 427—124 10 Claims

1. An improved method of fabricating electrosensitive laminates of the type including the steps of providing a substrate, coating the substrate with a solvent-based resin formulation, drying the coated substrate to evaporate the solvent and va-

por-depositing a metallic surface layer over the coated substrate, wherein the improved method employs as said solvent-based resin formulation a film-forming resin, a coloring material, a relatively volatile solvent, and a relatively nonvolatile



solvent, wherein said drying causes a diluent blush effect, which after vapor-depositing the metallic surface layer results in a whiteness of at least 83 measured according to Standard E313-73 of the American Society for Testing and Materials.

4,456,633

CHIP SEAL TECHNIQUE EMPLOYING BLENDS OF ASPHALTIC EMULSIONS

Anthony V. Grossi, Newark; Charles E. Bolen, Heath; Louis T. Hahn, East Newark, and Alfred Marzocchi, Newark, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Dec. 27, 1982, Ser. No. 453,028
Int. Cl.³ B05D *5/10*; E01C *5/12*
U.S. Cl. 427—138 **8 Claims**

1. In a chip seal surface treatment method for pavement maintenance comprising distributing a substantially uniform layer of a rapid setting aqueous asphaltic emulsion on said pavement and then applying an aggregate adapted for chip seal application onto said layer, whereby the emulsion breaks and bonds the aggregate to the asphalt of said emulsion, the improvement comprising blending with said rapid setting emulsion prior to distribution onto said pavement, effective aggregate retention improving amounts of an aqueous emulsion of the prereacted reaction product of an acrylamide, asphalt having a viscosity of less than about 120,000 cps (at 140° F.), a vinyl aromatic monomer and a rubbery polymer.

4,456,634

REACTION SINTERED SILICON CARBIDE

Francis S. Galasso, Manchester, and John J. Brennan, Portland, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 159,577, Jun. 16, 1980, abandoned. This application Dec. 18, 1981, Ser. No. 332,025
Int. Cl.³ B05D *3/04*
U.S. Cl. 427—228 **3 Claims**

1. The method of improving the impact resistance of a silicon carbide article which comprises:

applying a porous silicon powder compact to the surface of the article;

heating the article and compact to a temperature of about 1400° C. in a gas stream comprised of a non-reactive carrier gas selected from the group hydrogen, helium, argon, and mixtures thereof, in combination with a reactive hydrocarbon gas, the volume ratio of non-reactive gas to reactive gas at least about 3:1 to provide carbon for reaction with the silicon powder compact without depositing an impervious layer thereon, thereby forming a porous silicon carbide structure which, when adhered in a thickness of 2 mm to a hot pressed silicon carbide Charpy type test specimen, provides more than 5-fold increase in impact strength.

4,456,635

INTERMITTENTLY APPLIED COATING OF MAGNESIUM HYDROXIDE TO BOILER TUBES TO PREVENT SLAG AND DEPOSIT BUILDUP

Vincent M. Albanese, Lisle, Ill., and Andrew G. Keleher, Scottsdale, Ariz., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Dec. 30, 1982, Ser. No. 453,198
Int. Cl.³ B05D *7/22*
U.S. Cl. 427—230 **2 Claims**

1. A method of preventing slag and ash deposit buildup on the radiant section of the furnace walls of fossil fuel fired boilers which comprises intermittently maintaining on the surfaces of said radiant section of the furnace walls a thin film of magnesium hydroxide.

4,456,636

METHOD OF APPLYING HIGH-DENSITY INFORMATION RECORD LUBRICANTS

Vladimir S. Ban, Princeton Township, Mercer County, and Eugene S. Poliniak, Willingboro Township, Burlington County, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 30, 1983, Ser. No. 527,806
Int. Cl.³ B05D *3/12*
U.S. Cl. 427—240 **6 Claims**

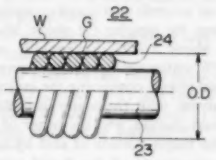
1. In the method for lubricating a capacitance electronic disc comprising applying a layer of methyl alkyl siloxane containing a dopant to the surface thereof, the improvement which comprises dissolving the lubricant and dopant in a butanol solution and applying to the disc surface.

4,456,637

SYSTEM FOR COATING AND REMOVING EXCESS MATERIAL FROM A MOVING WEB

Hideo Takeda, and Tsunehiko Sato, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 18, 1982, Ser. No. 359,448
Claims priority, application Japan, Mar. 20, 1981, 56-41060
Int. Cl.³ B05D *3/12*; B05C *11/02*
U.S. Cl. 427—355 **8 Claims**



1. A method of coating a web, comprising; excessively applying a coating solution to a web which is continuously run along a predetermined web running path, to form a coated film on said web, abutting a scraping surface of a metering means against said coated film, while wet, to scrape off an excess amount of coating solution from said coated film, to allow said coated film to have a desired thickness, said scraping surface being made of a wound wire member having a radius of curvature of 2 mm or less.

4,456,638

POLYMER PACKAGING MATERIAL FOR LIQUID CRYSTAL CELL

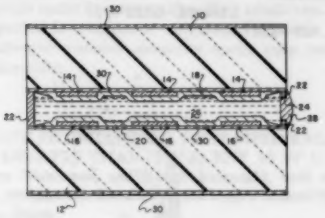
Robert J. Petcavich, Dallas, Tex., assignor to Polytronix, Inc., Richardson, Tex.

Continuation of Ser. No. 251,483, Apr. 6, 1981, abandoned. This application Nov. 1, 1983, Ser. No. 547,771
Int. Cl.³ C09K *3/34*
U.S. Cl. 428—1 **12 Claims**

1. In a field effect liquid crystal display cell having liquid

crystal material confined between a pair of substrates, at least one of said substrates including an electrode mounted thereon, said at least one substrate being a polymer film or sheet substrate characterized by:

(1) a glass transition point and melting point of 80° C. or higher with no secondary transitions between −50° C. and +80° C.;



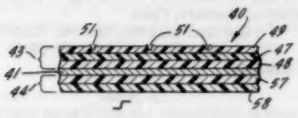
(2) a coefficient of thermal expansion matched with the electrode coefficient of thermal expansion;
(3) being an inert plastic having a crystallinity of twenty percent or more;
(4) having an ultraviolet stabilizer in the substrate;
(5) having an hydrophobic polymer for water resistance; and
(6) the chemical repeating units of the substrate being non-interactive with visible light.

4,456,639

LAMINATING FILM OF THERMOSET POLYESTER RESIN WITH EXTERNAL LAYER OF EMBOSSABLE THERMOPLASTIC RESIN

Herbert M. Drower, Wilmette, and Morton Minkus, Winnetka, both of Ill., assignors to Sealtran Corporation, Chicago, Ill.

Filed Jun. 7, 1982, Ser. No. 385,460
Int. Cl.³ A47G 1/12
U.S. Cl. 428—13 **16 Claims**



1. A laminating pouch, sealable by heat and pressure, for surface protection of an identification card or like document, the pouch having an outer surface that is embossable at temperatures and pressures suitable for heat sealing of the pouch and that is receptive to hot stamp transfers, the pouch comprising:

first and second transparent pouch elements joined to each other along a fold line, each pouch element comprising a laminate of an inner layer, a base layer. and an outer layer;

the inner layer being formed of an unoriented thermoplastic resin adhesive activatable for sealing by pressure when heated to a temperature within a range of about 250°to 300° F.;

the base layer being formed of a hard, tough, abrasion resistant biaxially oriented thermoset polyester resin that is highly resistant to embossure in the heat sealing range of the inner layer;

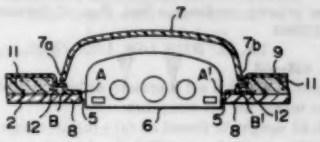
and the outer layer being at least as thick as the base layer and being formed of an unoriented thermoplastic polyester resin that is tough and abrasion resistant by that is embossable in the heat sealing range of the inner layer.

4,456,640

AUTOMOTIVE INSTRUMENT PANEL PAD

Tadashi Nishihara, Tokyo, Japan, assignor to Nissan Motor Company, Ltd., Yokohama, Japan

Filed Jan. 18, 1983, Ser. No. 458,889
Claims priority, application Japan, Feb. 22, 1982, 57-27974
Int. Cl.³ B32B 37/00
U.S. Cl. 428—31 **7 Claims**



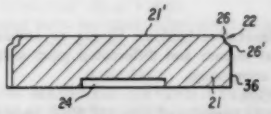
1. An automotive instrument panel pad covering an instrument panel except for an opening formed therein, including a stepped portion extending along the entire inner periphery of the pad, said stepped portion being interposed, adjacent to the margin of said opening, between said instrument panel and the bottom end of a cover member mounted in such a manner as to cover said opening.

4,456,641

CERAMIC SUBSTRATE FOR SEMICONDUCTOR PACKAGE

Hiroshi Ohtani, Mi-Ne, Japan, assignor to Narumi China Corporation, Aichi, Japan

Division of Ser. No. 307,062, Sep. 30, 1981. This application Jun. 14, 1982, Ser. No. 387,772
Claims priority, application Japan, Oct. 1, 1980, 55-138147
Int. Cl.³ B32B 3/02, 3/30
U.S. Cl. 428—35 **5 Claims**



1. A ceramic substrate for use as a semiconductor package comprising:

a plate member having a first face portion and having a peripheral surface located adjacent said first face portion and a stepped edge portion formed of a first and second crest, said edge portion being located between said peripheral surface and said first face portion so as to increase impact resistance to chipping and cracking of said ceramic substrate upon being impacted with an adjacent ceramic substrate wherein said first and second crest have a radius of curvature of between 0.04 and 0.06 mm inclusive.

4,456,642

GEL PADS AND A PROCESS FOR THEIR PREPARATION

Hans-Heribert Burgdörfer; Dietmar Schäpel, both of Cologne; Gottfried Schneider, Leverkusen; Wulf von Bonin, Leverkusen, and Ulrich von Gizycki, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 22, 1982, Ser. No. 342,033

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1981, 3103564

Int. Cl.³ B32B *1/04, 3/02, 27/40*

U.S. Cl. 428—68 14 Claims

1. A pad in which a gel is present within a flexible, resilient casing in which the gel comprises:

(a) 15–62 weight % (based on (a)+(b)) of a high molecular weight covalently cross-linked polyurethane matrix;

(b) 85–38 weight % (based on (a)+(b)) of a liquid dispersing agent which is a polyhydroxy compound having an average molecular weight between 1,000 and 12,000 and an OH number between 20 and 112 and which contains essentially no hydroxy compounds with a molecular weight below 800; and

(c) 0–100 weight % (based on (a)+(b)) fillers and/or additives.

4,456,643

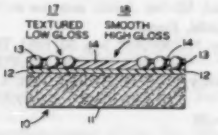
DECORATIVE LAMINATE

Timothy D. Colyer, Columbia, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jul. 29, 1982, Ser. No. 403,032

Int. Cl.³ B32B *3/00, 5/16*

U.S. Cl. 428—156 32 Claims



1. A decorative laminate having an embossed surface of differential texture and differential gloss suitable as a floor covering comprising

a substrate;

PVC resin particles of type GP PVC resin adhered to said substrate so constructed and arranged as to provide raised segments containing said PVC resin particles adjoining recessed segments which do not contain said PVC resin particles whereby said raised and recessed segments impart a relief pattern on the surface of said decorative laminate; and

a layer of transparent synthetic organic polymer adhered to the surface of said raised segments and said recessed segments;

whereby the raised segments of said decorative laminate exhibit a rougher surface texture and a lower gloss than the recessed segments of said decorative laminate.

4,456,644

CUSHIONING BODY FOR THE INTERIOR OF A VEHICLE, OR THE LIKE

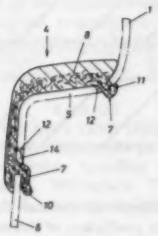
Joachim Janz, and Helmut Henne, both of Wuppertal, Fed. Rep. of Germany, assignors to Gebr. Happich GmbH., Fed. Rep. of Germany

Filed Feb. 1, 1982, Ser. No. 344,354

Claims priority, application Fed. Rep. of Germany, Feb. 2, 1981, 3107760

Int. Cl.³ B32B *3/12*

U.S. Cl. 428—158 12 Claims



1. A cushioned body for the interior of automotive vehicles, or the like, comprising:

an elastic foam plastic body having length and width dimensions; a continuous stiffening insert imbedded in the body; the insert being in the form of a mat;

a plurality of integral projections on the foam plastic body; each projection being narrower than the body along the length and width dimensions of the body, the projections being comprised of the same elastic foam plastic as the body; the projections including sections of the continuous stiffening insert mat therein and those sections including the foam plastic thereover; the projections protruding out of the plane of a surface of the cushioned body.

4,456,645

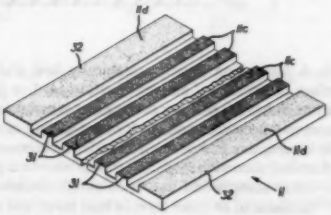
METHOD OF MAKING AN INTEGRAL CARBONIZED COOLER ASSEMBLY

Chang V. Chi, Brookfield, Conn., assignor to Energy Research Corporation, Danbury, Conn.

Filed Oct. 22, 1981, Ser. No. 313,807

Int. Cl.³ B32B *3/00, 31/26*

U.S. Cl. 428—166 8 Claims



1. A method of making an integral gas cooler assembly for use in cooling a fuel cell comprising:

applying an electrically conductive material to first regions of a first plate comprised of carbonizable material;

applying an adhesive material which is different from said conductive material to second regions of said first plate, said second regions bordering said first regions;

subsequent to said application of adhesive and conductive materials bringing said first plate and a second plate comprised of carbonizable material into adjacent relationship

such that said first and second regions of said first plate are brought together with corresponding first and second regions of said second plate, said first regions of said first and second plates defining cooling channels;

heating said plates when an adjacent relationship at a temperature sufficient to carbonize said plates;

and said adhesive, subsequent to carbonization of said plates, having sufficient adhesive strength to hold said plates together under commercial handling conditions.

7. A method in accordance with claim 1 wherein:

said adhesive material comprises epoxy resin cured with dianhydride.

4,456,646

LAMINATE FILM HAVING A HEAT-SHRINKAGE RATE GREATER THAN 15 PERCENT AT 90° C.

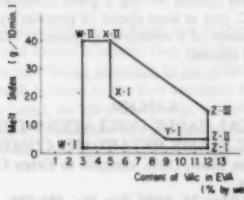
Yoshiharu Nishimoto, and Kengo Yamazaki, both of Iwaki, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1981, Ser. No. 313,622

Claims priority, application Japan, Oct. 31, 1980, 55-153450

Int. Cl.³ B32B *27/08*

U.S. Cl. 428—216 **6 Claims**



1. A laminate film having a heat-shrinkage rate of greater than 15% at 90° C., comprising a center layer consisting of a copolymer (I) of vinylidene chloride; at least two outermost layers each consisting of a mixture of 20 to 70% by weight of copolymer(II) of ethylene and alpha-olefin having a crystalline melting point of 110° to 125° C., and 80 to 30% by weight of a copolymer(III) of ethylene and vinyl acetate having a crystalline melting point of 85° to 103° C., said copolymer(II) being less than 65% by weight of the total amount of copolymers (II) and (III) in both of the outermost layers; and an adhesive layer between the center layer and the outermost layers.

4,456,647

PLASTICS MOULDINGS FINISHED WITH A THREE-LAYER COATING AND A PROCESS FOR PRODUCING THE FINISH

Manfred Schönfelder; Helmut Steinberger, both of Leverkusen, and Helmut Schmid, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,839

Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151350

Int. Cl.³ C08J *7/04*; B32B *7/02, 27/30, 27/42*

U.S. Cl. 428—216 **4 Claims**

1. A plastics moulding finished with a coating of three successively stoved layers, the first stoved layer applied to the surface of the plastics moulding being produced from a binder mixture of a hardenable acrylic resin and an aminoplast resin and containing at least one UV-absorber and at least one light stabiliser, the second stoved layer being produced from a binder mixture of a thermoplastic acrylic resin, a masked polyisocyanate and a plasticiser, and the third stoved layer being produced from a binder mixture of at least one partially hydrolysed organosilane, an α,ω-dihydroxy polydimethyl siloxane, a silica sol and at least one masked polyisocyanate in the presence of a water-soluble organic or inorganic acid and contains at least one UV-absorber.

4,456,648

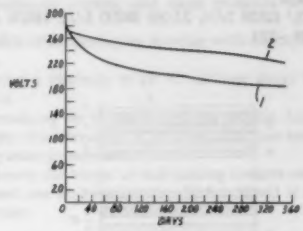
PARTICULATE-MODIFIED ELECTRET FIBERS

Jan W. C. Adamse, Hellevoetsluis, and Jan Van Turnhout, Pijnacker, both of Netherlands, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 9, 1983, Ser. No. 530,778

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—283 **7 Claims**



1. A modified fibrous web electret comprising fibers fibrillated from a film comprising two or more layers that comprise nonpolar polymeric material, one of said layers being substantially free of particulate matter, and another layer including particulate material which can potentially increase the conductivity of the layer, said particulate material having an average diameter smaller than the thickness of the layer, and said web maintaining a high charge level even when kept in a high humidity environment.

4,456,649

LOW-COST, HIGHLY FILLED, WAX-BASED HOT MELT ADHESIVES AND COATINGS

Wayne C. Clarke, Richmond, Va., assignor to Manville Service Corporation, Denver, Colo.

Continuation of Ser. No. 228,635, Jan. 26, 1981, abandoned, which is a continuation of Ser. No. 081,296, Oct. 2, 1979, abandoned. This application Mar. 15, 1982, Ser. No. 357,965

Int. Cl.³ B32B *17/10*

U.S. Cl. 428—285 **5 Claims**

1. A substrate having a composition deposited as a continuous coating thereon, said composition consisting essentially of in parts by weight:

high melt point paraffin: about 15 parts.

dark microwax: about 5 parts.

hydrocarbon resin: about 16 parts.

elastomeric copolymer: about 4 parts.

ultrafine ground inert, inorganic filler: about 60 parts.

4,456,650

FRICTION MATERIAL HAVING A COATING COMPRISING ALKANOLAMINE-CARBOXYLIC ACID SALTS

Donald J. Melotik, Dearborn Heights; Marvin H. Weintraub, West Bloomfield, and Arnold E. Anderson, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/01648, 371 Date Nov. 22, 1982, 102(e) Date Nov. 22, 1982

PCT Filed Nov. 22, 1982, Ser. No. 456,931

Int. Cl.³ B32B *27/00, 9/04*; C04B *9/02*; F16D *69/00*

U.S. Cl. 428—290 **9 Claims**

1. A friction material, which during use contacts rustable metal, having a coating comprising alkanolamine-carboxylic acid salts which are the reaction product of:

(i) one or more alkanolamines; and

(ii) one or more C_4-C_{20} carboxylic acids.

4,456,651

TAPE-WOUND INSULATION SHEATH OR JACKET FOR AN ELECTRICAL CONDUCTOR

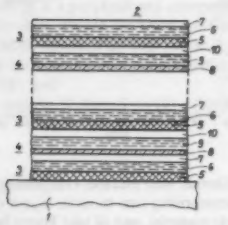
Franz-Josef Pollmeier, and Walter Ihlein, both of Berlin, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 29, 1982, Ser. No. 362,879

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1981, 3114420

Int. Cl.³ B32B *5/16, 27/38;* B05D *5/12;* H02K *1/04*

U.S. Cl. 428—324 8 Claims



1. In a tape-wound insulation sheath or jacket for an electrical conductor, such as a winding coil or bar of an electrical machine, which is impregnated with a hardenable impregnating resin and hardened, made up of several layers of tape including an inorganic, areal or sheet type insulating material such as mica flakes, mica foils or mica paper placed upon a flexible or pliable porous support, which is binder bonded to said insulating material and to said support, said binder bonding said insulating material to one another and to said support, the improvement wherein in the insulating sheath, between the layers of tapes with a porous support, single or multiple layers of tapes with a plastic foil as support are arranged.

4,456,652

ELECTRICALLY CONDUCTIVE ADHESIVE TAPE

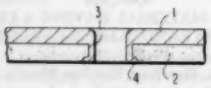
Toshiharu Konishi; Zenzo Honda; Yutaka Hori; Yukio Shimizu, and Hideyuki Okada, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Feb. 24, 1983, Ser. No. 469,476

Claims priority, application Japan, Feb. 24, 1982, 57-25940[U]

Int. Cl.³ B32B *3/00*

U.S. Cl. 428—344 1 Claim



1. An electrically conductive adhesive tape comprising a self-supporting electrically conductive tape support and a pressure-sensitive adhesive layer provided on at least one surface of the tape support, wherein electrically conductive portions which extend from the support through the adhesive layer and have a top end portion slightly covering the surface of the adhesive layer are provided on the side of the adhesive layer of the tape at desired intervals.

4,456,653

PIN FOR CONNECTING MACHINE ELEMENTS WITH EACH OTHER

Christoph Rüegg, Basel, and Peter Voirol, Binningen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 259,393, Jun. 1, 1981, abandoned. This application Mar. 28, 1983, Ser. No. 479,343

Claims priority, application Switzerland, May 9, 1980, 3656/80; Dec. 23, 1980, 9519/80

Int. Cl.³ B32B *15/00;* F16C *11/00*

U.S. Cl. 428—379 13 Claims

1. A pin having a central longitudinal pin axis and being adapted for connecting machine elements with each other, which pin comprises a metal shell and a core therein, said core consisting essentially of fully hardened, oil-fast matrix system of an epoxide resin system having a glass transition temperature above 200° C. and at least about 55 percent by volume of the total core volume of a reinforcing granular filler material embedded in said system.

4,456,654

ELECTRICAL CABLE INSULATED WITH AN ELASTOMERIC FLAME RETARDANT COMPOSITION

Vijayraj M. Kotian, Stow, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed May 24, 1982, Ser. No. 381,235

Int. Cl.³ B32B *27/00;* H01B *7/00*

U.S. Cl. 428—383 26 Claims

1. An electrical cable comprising at least one electrical conductor having an electrical insulation material disposed thereabout contained within a flexible, low smoke, elastomeric, flame retardant jacket adapted to char when exposed to a flame, said jacket made from a crosslinked composition comprising:

an elastomeric component comprising a copolymer of ethylene and methyl acrylate containing carboxylic crosslinking sites;

from about 180 parts to about 350 parts by weight of at least one filler per 100 parts by weight of said elastomeric comonent, said filler selected from the group consisting of calcium silicate, magnesium silicate and hydrated alumina fillers, and

said composition characterized by having a limiting oxygen index under ASTM D-2863 of at least about 45 percent and having a maximum specific optical density under ANSI/ASTM E 662-79 in a smoldering state of not more than about 160 and in a flaming state of not more than about 80.

4,456,655

ELECTRICAL CABLE INSULATED WITH A TREE-RESISTANT ETHYLENE POLYMER COMPOSITION

John K. Beasley, Wilmington, Del., and Edward J. Urban, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

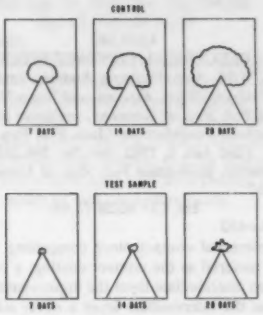
Division of Ser. No. 301,513, Sep. 14, 1981, Pat. No. 4,374,224. This application Sep. 28, 1982, Ser. No. 425,507

Int. Cl.³ B32B *15/00, 27/00*

U.S. Cl. 428—383 9 Claims

1. A power transmission cable comprising at least one metallic conductor surrounded by electrical insulation made of a composition consisting essentially of an ethylene polymer

selected from the group consisting of ethylene homopolymers and copolymers of ethylene with at least one other ethylenically unsaturated monomer, ethylene being present in such copolymers in an amount of at least 85 weight percent, and, as a tree growth inhibitor, an effective amount of at least one organic carboxylic ester having at least one but no more than two aromatic rings and at least three but no more than four



carboxylic ester groups, at least one carboxylic ester group being attached to one aromatic ring and the remaining carboxylic ester groups being attached to the other aromatic ring, if present, which is fused to the first aromatic ring or joined to it by a single bond, an alkylene group, a carbonyl group, or a hetero atom, said inhibitor being liquid at the power transmission cable's intended operating temperatures.

4,456,656

Patent Not Issued For This Number

4,456,657

METAL-CLAD LAMINATE ADAPTED FOR PRINTED CIRCUITS

Robert Cassat, Ternay, and Bruno Vignando, Saint-Fons, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Oct. 22, 1981, Ser. No. 314,014

Claims priority, application France, Nov. 5, 1980, 80 23943

Int. Cl.³ B32B *15/06, 17/10, 19/04*

U.S. Cl. 428—415 **14 Claims**

1. A metallized, laminated substrate consisting essentially of:

(A) an electrically insulating support element which comprises (a) a central core member comprising a major proportion by weight of a cellulosic or mica filler and a proportion of less than 40% by weight of a thermosetting resin which is a polyimide resin or a mixture of polyimide resin and epoxy resin, said central core (a) being prepared by papermaking technique, and (b) and (b′) a pair of skin laminae coextensively secured to each face surface, respectively, of said central core (a), each of said skin laminae comprising a fibrous glass, asbestos or heat-stable synthetic polymer reinforcing filler, and a thermosetting resin impregnant, which thermosetting resin may either be the same as or different from the thermosetting resin comprising said central core member (a); and

(B) an electrically conducting metal foil (c) coextensively adhered to the exposed face surface of one or the other of said skin laminae (b) or (b′).

4,456,658

USE OF CLEAR COATING BASED ON ORGANIC POLYISOCYANATES FOR COATING SHEET PRODUCTS BASED ON POLYVINYL CHLORIDE

Werner Kubitza, and Gerhard Mennicken, both of Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 10, 1983, Ser. No. 457,104

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1982, 3202166

Int. Cl.³ B32B *27/08, 27/30*; C08G *18/10*

U.S. Cl. 428—424.6 **5 Claims**

1. A process for coating polyvinyl chloride sheet products which comprises coating said sheet products with a clear coating

(i) capable of hardening by reacting with atmospheric moisture,

(ii) having a viscosity at 23° C. of from about 60 to 2500 mPa.s,

(iii) containing up to about 15% by weight, based on the weight of said coating, of solvents which are inert towards isocyanate groups and

(iv) wherein the binder of said coating consists essentially of at least one polyisocyanate which is liquid at room temperature.

4,456,659

SUBSTRATE FOR OPTICAL DISC RECORDING MEDIA

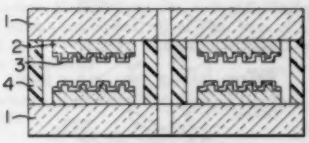
Ryoichi Sudo, Yokosuka; Hiroaki Miwa, and Takeshi Watanabe, both of Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 25, 1983, Ser. No. 469,590

Claims priority, application Japan, Mar. 10, 1982, 57-36372

Int. Cl.³ B32B *9/04, 13/12*

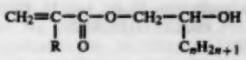
U.S. Cl. 428—447 **6 Claims**

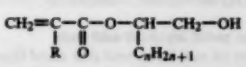


1. A substrate for optical disc recording media which comprises a transparent substrate and a sublayer formed thereon, which sublayer comprises a UV-curable resin film and a thermally decomposing high molecular weight film, characterized in that said UV-curable resin film existing between the transparent substrate and the thermally decomposing high molecular weight film of the sublayer is composed of a UV-curable composition comprising:

(a) a high molecular weight substance of 500 to 10,000 M.W. having acrylic or methacrylic group at one or both ends of the molecule and also a polybutadiene skeleton within the molecule,

(b) at least one compound selected from the compounds represented by the general formulas (1) and (2):


(1)


(2)

wherein R is H or CH_3 and n is an integer of from 2 to 16,

(c) a reactive diluent containing at least one acrylic or meth-

acrylic group within the molecule and having a viscosity of 100 mPa.s or lower at 25° C., (a), (b) and (c) being mixed so as to fall within an area formed by connecting the following three points A, B and C in a triangle,

	The high molecular substance of 500 to 10,000 M.W. mentioned in (a) above, % by weight	At least one compound selected from the compounds represented by the above general formulas (1) and (2), % by weight	The diluent mentioned in (c) above, % by weight
A	70	30	0
B	20	80	0
C	20	30	50

and, (d) 0.5 to 5 parts by weight of a photo-polymerization initiator based on 100 parts by weight of a mixture of the above components (a), (b) and (c).

5. A substrate for optical disc recording media according to claim 1, wherein said UV-curable composition further comprises a silane coupling agent.

4,456,660

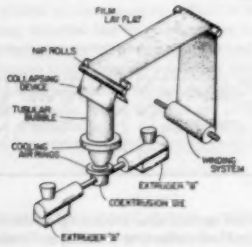
COEXTRUDED TWO-PLY LAMINATE FILMS OF LOW DENSITY POLYETHYLENE AND BLEND OF POLYBUTENE-1 AND POLYETHYLENE OR POLYPROPYLENE

Edward A. Colombo, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 969,038, Dec. 13, 1978, abandoned. This application Aug. 6, 1980, Ser. No. 175,784

Int. Cl.³ B32B *1/02, 27/08;* **B65D** *29/06*

U.S. Cl. 428—516 **2 Claims**



1. A coextruded two-layer laminated film in which one of the lamina is low density polyethylene and the other lamina comprises a blend of between about 10 and about 50 weight percent of polybutene-1 and between about 90 and about 50 weight percent of low density polyethylene.

4,456,661

MAGNETIC RECORDING MEDIUM

Nobuyuki Yamamoto, Shizuoka, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 4, 1981, Ser. No. 289,857

Claims priority, application Japan, Aug. 15, 1980, 55-112415

Int. Cl.³ G11B *5/72*

U.S. Cl. 428—607 **7 Claims**

1. A magnetic recording tape, comprising:

base;

a thin magnetic metal layer on said base:

a thin metal film on said layer, said thin metal film comprised of a metal selected from the group consisting of Mg, Ca, Sr, Ba, Cu, Zn, Cd, Sn and Pb; and

a layer of aliphatic acid formed on said thin metal film, wherein said thin metal film chemically reacts with said aliphatic acid layer.

4,456,662

ELECTRICAL CONTACT PIECE

Malikowski, Willi, Aschaffenburg; Andreas Szulczyk, Linsengericht; Wolfgang Böhm, Alzenau, and Roger Wolmer, Frankfurt, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 8, 1982, Ser. No. 386,265

Claims priority, application Fed. Rep. of Germany, Jun. 12, 1981, 3123357

Int. Cl.³ B32B *15/00*

U.S. Cl. 428—632 **23 Claims**

1. In an electrical contact piece comprising a silver-metal oxide work material as the contact coating, a copper or iron carrier and an intermediate layer the improvement comprising employing as the intermediate layer a silver alloy consisting essentially of (a) 2 to 12 weight % of at least one member of the group consisting of tin, indium and germanium and (b) silver.

4,456,663

HOT-DIP ALUMINUM-ZINC COATING METHOD AND PRODUCT

Ralph W. Leonard, Pittsburgh, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 326,732, Dec. 2, 1981, abandoned. This application Nov. 4, 1982, Ser. No. 439,157

Int. Cl.³ B32B *15/10;* **C23C** *1/08*

U.S. Cl. 428—653 **16 Claims**

1. In the method for producing corrosion-resistant coatings, metallurgically bonded to ferrous-base articles, which comprises dipping a clean surface of said article into a molten bath containing aluminum and zinc for a period at least sufficient to form an aluminum-zinc coating thereon with an interfacial alloy layer having a thickness greater than about 0.01 mils, said layer resulting from the reaction of the ferrous surface with the bath, removing the coated surface from said bath and cooling the molten layer adhering thereto,

the improvement for producing a coating which provides a superior combination of general and sacrificial corrosion resistance, which comprises using a bath consisting essentially of 12 to 24% zinc, 0.3 to 4% silicon, 0.3 to 3.5% iron and the balance aluminum.

4. The coated product produced by the method of claim 1.

4,456,664

ELECTRONICALLY CONDUCTIVE MAGNESIA DOPED OXIDE CERAMICS FOR USE IN SODIUM SULFUR BATTERIES

Gary M. Crosbie, Dearborn; Gerald J. Tennenhouse, Southfield; Ragnar P. Tischer, Birmingham, and Halina S. Wroblowa, West Bloomfield, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 19, 1983, Ser. No. 503,202
Int. Cl.³ H01M *10/39*
U.S. Cl. 429—104 11 Claims

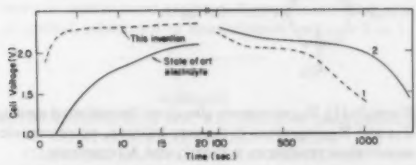
1. An improved electrically conductive current collector suitable for use at high temperatures and in the presence of corrosive environments, characterized in that the current collector comprises a metal or metal alloy having a ceramic coating thereon, at least in the region in contact with said corrosive environment, wherein said ceramic coating comprises chromium oxide doped with at least 0.05 mole percent magnesium oxide based on moles of said chromium oxide.

4,456,665

CALCIUM ELECTROCHEMICAL RESERVE CELL

Emanuel Peled, Even Yehuda; Azieh Meitav, Rishon-Lecion, and Mordechai Brand, Tel Aviv, all of Israel, assignors to Ramot University Authority For Applied Research and Industrial Development Ltd., Tel Aviv, Israel

Filed Jul. 9, 1982, Ser. No. 396,839
Claims priority, application Israel, Jul. 16, 1981, 63337
Int. Cl.³ H01M *4/36*
U.S. Cl. 429—105 12 Claims



1. An electrochemical reserve cell of short activation time comprising:

a calcium dischargeable calcium alloy anode essentially devoid of alkali metal;

an inorganic oxyhalide liquid cathode serving also as solvent for the electrolyte salt;

an electrolyte salt consisting of Lewis acid and a calcium Lewis base, said Lewis acid being in excess of the Lewis base, and an inert current collector;

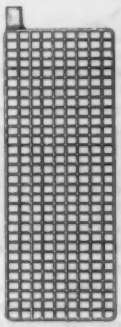
said electrolyte solution being stored separately from said electrode compartment, means being provided for contacting said solution with said electrodes when the cell is to be activated.

4,456,666

TITANIUM WIRE REINFORCED LEAD COMPOSITE ELECTRODE STRUCTURE

Neil C. Otto, Chicago; Herbert K. Giess, Hoffman Estates, and Jeffrey W. Mainzer, Mt. Prospect, all of Ill., assignors to GNB Batteries Inc., Mendota Heights, Minn.

Filed Oct. 13, 1982, Ser. No. 434,078
Int. Cl.³ H01M *4/66*
U.S. Cl. 429—245 17 Claims



1. An electrode support structure for a lead-acid battery cell comprising a titanium wire reinforced cast lead composite; said composite further comprising titanium wires embedded in a cast lead matrix.

4,456,667

TAMPERPROOF DOCUMENT AND A PROCESS FOR PRODUCING THE SAME

Richarda Bochow; Helmut Bergmann, both of Fallingbostel, and Siegfried Eikemeier, Soltau, all of Fed. Rep. of Germany, assignors to Agfa-Gavaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 26, 1982, Ser. No. 401,655
Claims priority, application Fed. Rep. of Germany, Jul. 30, 1981, 3130071
Int. Cl.³ G03C *3/00*
U.S. Cl. 430—10 14 Claims

1. A tamperproof document consisting of an information carrier in the form of a photographic material covered with information and laminated on both sides to at least one transparent foil, characterised in that the photographic material has a gelatin-containing outer front-layer and the foil is bonded to the surface of the said gelatin-containing layer by means of an adhesive layer containing a poly-1,2 -alkyleneimine.

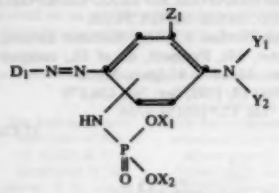
4,456,668

AZO DYES CONTAINING PHOSPHAMIC ACID DIESTER GROUPS

John Lenoir, and Gérald Jan, both of Fribourg, Switzerland, assignors to Ciba Geigy AG, Basel, Switzerland

Division of Ser. No. 258,245, Apr. 28, 1981, Pat. No. 4,409,143.
This application Sep. 29, 1982, Ser. No. 426,489
Claims priority, application Switzerland, Apr. 30, 1980, 3341/80
Int. Cl.³ G03C *7/26*
U.S. Cl. 430—17 10 Claims

1. A photographic silver dye bleach material material which comprises, on a support, at least one layer containing a dye of the formula



(1)

in which X_1 and X_2 independently of one another are substituted or unsubstituted alkyl having 1 to 24 carbon atoms, alkenyl having 2 to 4 carbon atoms, substituted or unsubstituted cycloalkyl having 5 or 6 carbon atoms, substituted or unsubstituted aryl or aralkyl having 1 to 4 carbon atoms in the alkyl moiety, Y_1 is hydrogen or substituted or unsubstituted alkyl having 1 to 5 carbon atoms, Y_2 is hydrogen, substituted or unsubstituted alkyl having 1 to 12 carbon atoms, alkenyl having 2 to 4 carbon atoms or substituted or unsubstituted aryl or together with Y_1 stands for the atoms required to complete a substituted or unsubstituted ring, Z_1 is hydrogen, substituted, or unsubstituted alkyl having 1 to 4 carbon atoms, alkenyl having 2 to 4 carbon atoms, substituted or unsubstituted alkoxy having 1 to 5 carbon atoms, substituted or unsubstituted aryl or aryloxy, substituted or unsubstituted alkylmercapto having 1 to 5 carbon atoms, substituted or unsubstituted arylmercapto, halogen, cyano or carbalkoxy having 2 to 5 carbon atoms, or stands for the atoms which together with Y_1 form a substituted or unsubstituted ring and D_1 is the radical of a substituted or unsubstituted, homocyclic or heterocyclic, diazo component.

4,456,669

IMAGE FORMING PROCESS

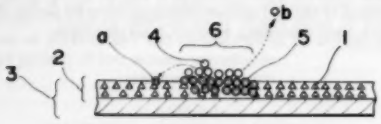
Keiichi Yubakami, Neyagawa; Yuji Takashima, Nishinomiya, and Wataru Shimotsuma, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 15, 1982, Ser. No. 388,732

Claims priority, application Japan, Jun. 16, 1981, 56-93328

Int. Cl.³ G03C *5/00*; G03G *7/00, 13/14*; B41L *1/20*

U.S. Cl. 430—45 **10 Claims**



1. An image forming process comprising a step of arranging on a support member, in accordance with image signals, image forming particles containing a resin and a dye former which develops its color in reaction with a color developing agent; a heat-transfer step of heating said particles to vaporize said dye former thereby to transfer said dye former onto an image receiving substrate; and a step of causing said color developing agent to be applied to said dye former on said image receiving substrate after said heat-transfer step to provide colored images.

6. The image forming process in accordance with claim **1**, wherein the support member is a photoconductive member.

4,456,670

PHOTOSENSITIVE MATERIAL FOR LITHOGRAPHIC PRINTING

Takao Nakayama; Chikashi Ohishi; Sho Nakao, and Keisuke Shiba, all of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 6, 1982, Ser. No. 405,773

Claims priority, application Japan, Aug. 6, 1981, 56-123325

Int. Cl.³ G03G *13/32*

U.S. Cl. 430—49 **7 Claims**

1. A photosensitive material for lithographic printing, comprising:

a paper support base;

an aluminum foil layer positioned on a surface of the support base,

an intermediate layer comprising particles selected from the group consisting of colloidal silica particles colloidal alumina particles and mixtures thereof the intermediate layer positioned on the aluminum foil layer wherein the intermediate layer has a thickness from about 0.01 to 10 μm; and

a photoconductive layer positioned on the intermediate layer.

4,456,671

ELECTROPHOTOGRAPHIC PHOTOSENSITIVE MEMBER HAVING A PHOTOSENSITIVE LAYER CONTAINING A HYDRAZONE COMPOUND

Minoru Mabuchi, Tokyo; Naoto Fujimura; Shozo Ishikawa, both of Yokohama; Yoshio Takasu, Tama; Kiyoshi Sakai, Mitaka, and Masaki Kuribayashi, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 13, 1982, Ser. No. 449,417

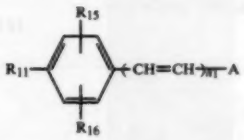
Claims priority, application Japan, Dec. 23, 1981, 56-208912; Dec. 23, 1981, 56-208913; Dec. 23, 1981, 56-208914; Dec. 24, 1981, 56-215483; Dec. 24, 1981, 56-215484; Dec. 25, 1981, 56-214699; Dec. 25, 1981, 56-214700; Dec. 25, 1981, 56-214701

Int. Cl.³ G03G *5/06, 5/14*

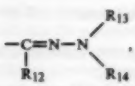
U.S. Cl. 430—58 **26 Claims**

1. An electrophotographic photosensitive member comprising a conductive substrate and a layer containing at least one hydrazone compound represented by the following formula (1), (2), (3), (4), or (5) and a binder:

Formula (1)



in Formula (1); R_{11} represents alkoxy or disubstituted amino; R_{15} and R_{16} represent hydrogen, halogen, or an organic monovalent residue; n_1 is 0 or 1; and A represents



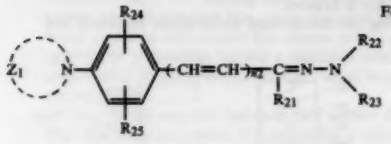
wherein R_{12}, R_{13}, and R_{14} represent alkyl, aryl, or aralkyl, substituted or unsubstituted, with the proviso, that;

when R_{12} is alkyl, R_{13} represents aryl and R_{14} represents alkyl, aryl, or aralkyl,

when R_{12} is aryl, R_{13} represents aralkyl and R_{14} represents aryl, and

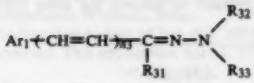
when R_{12} is aralkyl, R_{13} and R_{14} represent alkyl, aryl, or aralkyl,

Formula (2)



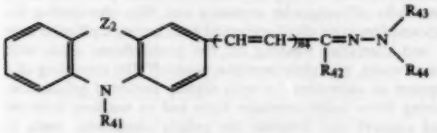
in Formula (2); Z_1 represents a residue necessary to complete a cyclic amino group; R_{21}, R_{22}, and R_{23} represent alkyl, aryl, or aralkyl, substituted or unsubstituted; R_{24} and R_{25} represent hydrogen, halogen, or an organic monovalent residue; and n_2 is 0 or 1,

Formula (3)



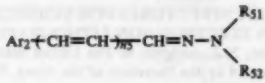
in Formula (3); Ar_1 represents a substituted or unsubstituted aromatic polycyclic residue; R_{31}, R_{32}, and R_{33} represent alkyl, aryl, or aralkyl, substituted or unsubstituted; and n_3 is 0 or 1,

Formula (4)



in Formula (4); Z_2 represents oxygen, sulfure, or $-CH_2-$; R_{41} represents alkyl or aralkyl, substituted or unsubstituted; R_{42}, R_{43}, and R_{44} represent alkyl, aryl, or aralkyl, substituted or unsubstituted; and n_4 is 0 or 1,

Formula (5)



in Formula (5); Ar_2 represents a substituted or unsubstituted aromatic polycyclic residue or a phenyl substituted at least by piperidino or morpholine; R_{51} represents substituted or unsubstituted naphthyl; R_{52} represents alkyl, aryl, or aralkyl, substituted or unsubstituted; and n_5 is 0 or 1.

4,456,672
ELECTROPHOTOGRAPHIC RECORDING MATERIALS CONTAINING TRIAZOLE CHARGE CARRIER-TRANSPORTING COMPOUNDS

Heinz Ellingsfeld; Karl-Heinz Etzbach, both of Frankenthal; Gerhard Hoffmann, Otterstadt, and Peter Neumann, Wiesloch, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

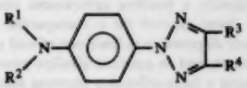
Filed Apr. 27, 1983, Ser. No. 489,012

Claims priority, application Fed. Rep. of Germany, Apr. 29, 1982, 3215967

Int. Cl.³ G03G *5/06, 5/14*

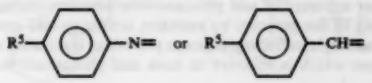
U.S. Cl. 430—59 **4 Claims**

1. An electrophotographic recording material comprising an electrically conductive base, charge carrier-producing compounds and charge carrier-transporting compounds, which contains, as charge carrier-transporting compounds, those of the formula (I)



(I)

where R^1 and R^2 are identical or different and are each hydrogen, alkyl, allyl, benzyl or unsubstituted or substituted phenyl, or R^1 and R^2 together are



where R^5 is NR^1R^2, R^3 is alkyl or phenyl and R^4 is alkyl, vinyl, allyl, carbalkoxy, acryloyl or methacryloyl.

3. An electrophotographic recording material as claimed in claim 1, comprising an electrically conductive base, a layer containing charge carrier-producing compounds and another layer containing charge carrier-transporting compounds of the formula (I) given in claim 1.

4,456,673
TRANSFER-TYPE ELECTROSTATIC COPYING METHOD

Yutaka Shigemura, Takarazuka; Masahiko Hisajima, Osaka; Hiroshi Kimura, Habikino; Isao Yada, Neyagawa; Yoichiro Irie, Suita; Kiyoshi Morimoto, Osaka, and Takashi Nagashima, Neyagawa, all of Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Mar. 9, 1982, Ser. No. 356,538

Claims priority, application Japan, Mar. 24, 1981, 56/41795

Int. Cl.³ G03G *13/22*

U.S. Cl. 430—125 **3 Claims**

1. In an electrostatic copying method of the transfer type which comprises repeatedly performing a copying cycle including an image-forming step of forming a latent electrostatic image on a photosensitive material moved through an endless moving path or a toner image obtained by developing the latent electrostatic image, a transfer step of transferring the latent electrostatic image or the toner image on the photosensitive material to a receptor member subsequent to the image-forming step, and a cleaning step of cleaning the photosensitive material subsequent to the transfer step; the improvement which comprises determining the width and length of the receptor member to be used in the next copying cycle, automatically comparing at least one of the width and length of the receptor member to be used in the next copying cycle with at least one of the width and length respectively of the receptor member used in the preceding copying cycle, and only when at least one of the width or length of the receptor member to be used in the next copying cycle is found to be larger than at least one of the width or length respectively of the receptor member used in the preceding copying cycle, repeating said cleaning step after the end of the preceding copying cycle and before the next copying cycle is started.

4,456,674
COLOR TRANSFER PHOTOGRAPHIC PROCESSES AND PRODUCTS

Leon D. Cerankowski, Carlisle; Gary S. LaPointe, Beverly, and Neil C. Mattucci, Billerica, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

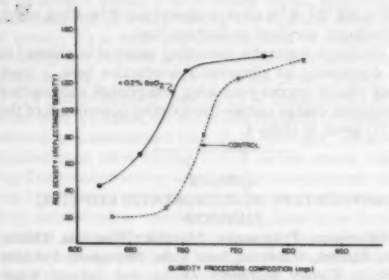
Continuation-in-part of Ser. No. 437,896, Nov. 1, 1982, abandoned. This application Jul. 25, 1983, Ser. No. 516,597

Int. Cl.³ G03C *5/54, 1/84, 7/00, 1/40*

U.S. Cl. 430—221 **49 Claims**

18. In a photographic film unit adapted for forming a transfer image viewable as a reflection print including a negative

component comprising a photosensitive silver halide emulsion carried on a support; a positive component comprising an image-receiving layer carried on a transparent support; an acid-reacting layer disposed in at least one of said negative and positive components; and an aqueous alkaline processing composition comprising a light-reflecting pigment and at least one light-absorbing, pH sensitive optical filter agent releasably contained in a rupturable container positioned to release said composition for distribution between said negative and said positive components, the combination of said light-reflecting pigment and said optical filter agent being effective to prevent further exposure of said photosensitive emulsion during processing in the presence by radiation actinic to said emulsion and said light-reflecting pigment providing layer after development which is effective to mask said photosensitive layer



and provide a background for viewing the transfer image by reflected light;

the improvement which comprises employing as said processing composition, an aqueous solution of alkali metal hydroxide comprising a light-reflecting pigment, a carboxynaphthol phthalein optical filter agent and an alkali soluble alkali earth metal salt in an amount sufficient to increase the transmission density of said processing composition layer distributed between said negative and positive components at a fixed concentration of said carboxynaphthol phthalein.

33. A photographic product as defined in claim 18 wherein an image dye-providing material is associated with said photosensitive silver halide emulsion, said image dye-providing material being adapted to provide a dye diffusible to said image-receiving layer for forming a dye image.

4,456,675

DRY PROCESS FOR FORMING METAL PATTERNS WHEREIN METAL IS DEPOSITED ON A DEPOLYMERIZABLE POLYMER AND SELECTIVELY REMOVED

Herbert R. Anderson, Jr., Patterson; Constance J. Araps, Wappingers Falls, and Catherine A. Lotsko, Beacon, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jul. 26, 1983, Ser. No. 517,307
Int. Cl.³ B05D *3/02*
U.S. Cl. 430—256 **6 Claims**

1. A process for forming a desired metal pattern on a substrate which comprises:

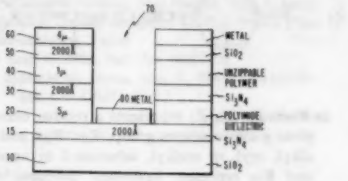
forming a mask of a thermally depolymerizable polymer on the substrate with a pattern of openings complementary to the desired metal pattern;

blanket coating the substrate and the mask with a metal;

heating the substrate to depolymerize the depolymerizable polymer;

cooling the surface of the metal to thereby delaminate the metal coated in areas where thermally depolymerizable polymer is present;

removing the delaminated metal where necessary; and



optionally plasma ashing the depolymerized polymer if residue thereof remains to remove the same from said substrate.

4,456,676

AMINE STABILIZERS FOR WASH-OFF SYSTEMS

James M. Ciskowski, Aberdeen, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 10, 1983, Ser. No. 503,294
Int. Cl.³ G03F *7/02*; G03C *1/06*
U.S. Cl. 430—264 **3 Claims**

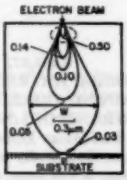
1. A process of producing an image on a photosensitive wash-off film by tanning development, which process consists essentially of imagewise exposing said film, developing the exposed film in an alkali-activating bath having a pH of at least 9, and thereafter washing off the nonhardened areas with warm water, said photosensitive wash-off film consisting of a support, an unhardened or only slightly hardened gelatin-containing silver halide emulsion layer and an auxiliary layer on said support, and wherein the gelatin constituent tends to become water-insoluble and to bind to the support during storage, characterized in that a stabilizing amount of an amino acid or amine-containing polymer is incorporated into the silver halide emulsion layer or into an auxiliary layer.

4,456,677

COMPOSITE RESIST STRUCTURES FOR SUBMICRON PROCESSING IN ELECTRON/ION LITHOGRAPHY

Te N. Chin, Princeton, N.J., assignor to The United Stated of America as represented by the Secretary of the Army, Washington, D.C.

Division of Ser. No. 294,106, Aug. 19, 1981, abandoned. This application Aug. 10, 1982, Ser. No. 406,825
Int. Cl.³ G03C *1/78, 1/96*
U.S. Cl. 430—276 **4 Claims**



1. A composite resist structure for submicron processing in electron/ion lithography which comprises:

substrate means for holding submicron electronic and optical circuits thereon;

first film means positioned intermediate said circuit and electron beams for slowing down incident electron beams having potentials of approximately 10 KeV, which includes an aluminum layer having a thickness of approximately 5680 Å;

second film means positioned in contact with one side of said

aluminum layer for causing said electron beam which passes through said first film means to act as an isotropic beam source in said second film means, which includes a gold layer of material having a thickness which allows only a small fraction of said isotropic beam to pass therethrough; and

third film means disposed between said second film means and said substrate means for providing a positive resist film suitable for said submicron processing.

4,456,678

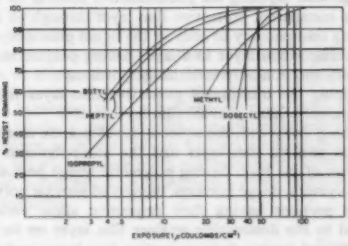
HIGH RESOLUTION LITHOGRAPHIC RESIST OF NEGATIVE WORKING CATIONIC VINYL POLYMER

Kang I. Lee, Framingham; William Jensen, Waltham, and Peter Cukor, Natick, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 255,936, Apr. 20, 1981, abandoned. This application Apr. 4, 1983, Ser. No. 481,611

Int. Cl.³ G03C 1/68

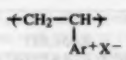
U.S. Cl. 430—279 **25 Claims**



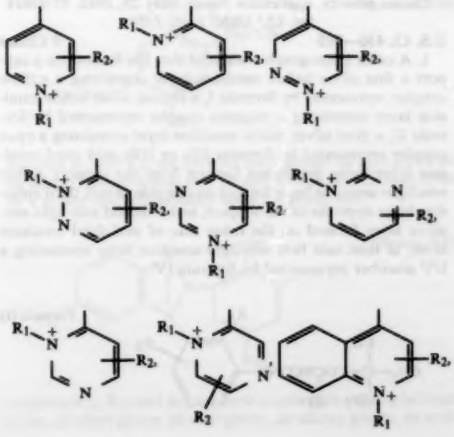
1. A medium for electron beam lithographic recording comprising

a substrate; and

a solid film overlying said substrate, said solid film consisting essentially of a negative working cationic vinyl polymer resist consisting of a repeating unit



where Ar^+ is selected from



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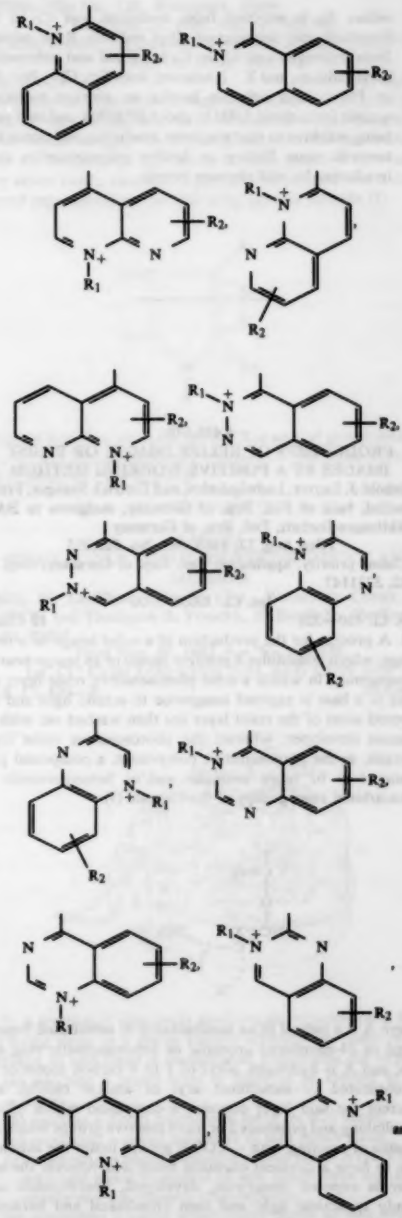

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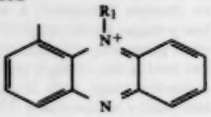


where R_1 is selected from hydrogen and C_1 to C_{12} branched and unbranched alkyl radicals, R_2 is selected from hydrogen and C_1 to C_4 branched and unbranched alkyl radicals, and X^- is selected from F^-, Cl^-, Br^-, I^-, or PF_6^-, said polymer having an average molecular weight from about 5,000 to about 1000,000, and said resist being sensitive to electron beam irradiation and unreactive towards cross linking or further polymerization upon irradiation by said electron beams.

4,456,679

PRODUCTION OF RELIEF IMAGES OR RESIST IMAGES BY A POSITIVE-WORKING METHOD

Reinhold J. Leyrer, Ludwigshafen, and Dietrich Saenger, Frankenthal, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

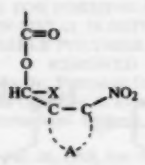
Filed Aug. 22, 1983, Ser. No. 525,395

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1982, 3231147

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—326 **19 Claims**

1. A process for the production of a relief image or a resist image, which constitutes a positive image of an image-bearing transparency, in which a solid photosensitive resist layer applied to a base is exposed imagewise to actinic light and the exposed areas of the resist layer are then washed out with an aqueous developer, wherein the photosensitive resist layer contains, as the photosensitive component, a compound possessing two or more aromatic and/or heteroaromatic o-nitrocarbinol ester groups of the formula (I)



(I)

where A is a radical of an unsubstituted or substituted 5-membered to 14-membered aromatic or heteroaromatic ring system, and X is hydrogen, alkyl of 1 to 8 carbon atoms or an unsubstituted or substituted aryl or aralkyl radical, and wherein the said layer contains a compound which effects crosslinking and possesses 2 or more reactive groups which are capable of reacting with —COOH groups under the action of heat to form a covalent chemical bond, and wherein the said layer is exposed imagewise, developed, post-exposed uniformly to actinic light and then crosslinked and hardened under the action of heat.

4,456,680

PROCESS FOR PREPARING A MASK FOR SANDBLASTING

Shohei Nakamura, and Yoshimasa Tuji, both of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 12, 1983, Ser. No. 493,909

Claims priority, application Japan, May 13, 1982, 57-79184

Int. Cl.³ G03C *11/12, 1/90*

U.S. Cl. 430—258 **8 Claims**

1. A process for preparing a mask for sandblasting, which comprises the steps of:

(a) interposing a liquid photopolymerizable composition layer between a destroyable retainer film layer strippably attached onto the lower surface of a support film layer and a transparent soluble peel-aid film layer superimposed on a transparent protective film layer, thereby to form a photosensitive element,

said transparent soluble peel-aid film layer having a peeling resistance of 10 g/cm or less against the transparent protective film layer and being soluble in an aqueous developer;

(b) image-wise exposing the photosensitive element on its side of the transparent protective film layer through an image-bearing transparency to convert the liquid photopolymerizable composition layer to a layer having polymeric image portions and non-polymeric image portions;

(c) stripping the transparent protective film layer from the transparent soluble peel-aid film layer; and

(d) washing away with the aqueous developer the transparent soluble peel-aid film layer and the non-polymeric image portions of the layer having polymeric image portions and nonpolymeric image portions, thereby to provide polymeric image portions having their respective upper ends connected to the destroyable retainer film layer on its lower surface and having their respective free lower ends to be attached onto the surface of an article for sandblasting,

said support film layer being adapted to be stripped from the destroyable retainer film layer while maintaining adherence of the destroyable retainer film layer to the respective upper ends of the polymeric image portions,

said destroyable retainer film layer being adapted to be destroyed by sandblasting.

4,456,681

COLOR PHOTOGRAPHIC MATERIALS

Takashi Kadowaki, and Kaoru Onodera, both of Odawara, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Japan

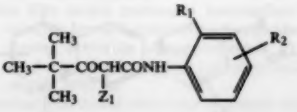
Filed May 27, 1983, Ser. No. 498,640

Claims priority, application Japan, May 28, 1982, 57-90834

Int. Cl.³ G03C *1/46, 1/84*

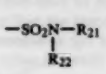
U.S. Cl. 430—505 **9 Claims**

1. A color photographic material that has formed on a support a first silver halide emulsion layer containing a yellow coupler represented by formula I, a second silver halide emulsion layer containing a magenta coupler represented by formula II, a third silver halide emulsion layer containing a cyan coupler represented by formula IIIa or IIIb, said third emulsion layer being positioned farthest from the support, a first non-light-sensitive layer formed on one side of said third emulsion layer opposite to the support, and a second non-light-sensitive layer formed on the other side of said third emulsion layer, at least said first non-light-sensitive layer containing a UV absorber represented by formula IV:



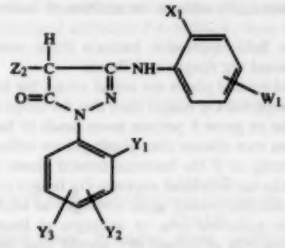
Formula (I)

wherein R_1 is a hydrogen atom, a halogen atom or an alkoxy group; R_2 is —NHCOR$_{21}$, —NHSO$_2$R$_{21}$, —COOR$_{21}$ or



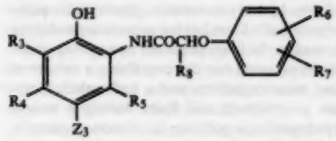
(wherein R_{21} and R_{22} are each an alkyl group which may be substituted); and Z_1 is an atom or a group that is eliminated upon coupling;

Formula (II)



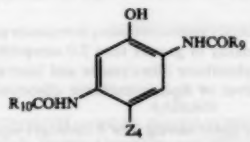
wherein X_1 is a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, an aryloxy group, an amido group, a hydroxy group, a cyano or a nitro group; Y_1, Y_2 and Y_3 are each a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group, a carboxy group, an alkoxycarbonyl group, a nitro group, an aryloxy group, a cyano group or an acylamino group; W_1 is a hydrogen atom, a halogen atom or a monovalent organic group; and Z_2 is an atom or a group that is eliminated upon coupling;

Formula (IIIa)



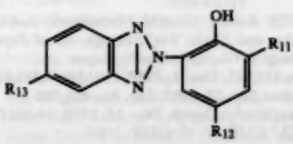
wherein R_3, R_4 and R_5 are each a hydrogen atom, a halogen atom, an alkyl group, an aryl group or an alkoxy group; R_6 and R_7 are each a hydrogen atom, an alkyl group or an alkoxy group; R_8 is a hydrogen atom or an alkyl group; and Z_3 is an atom or a group that is eliminated upon coupling;

Formula (IIIb)



wherein R_9 and R_{10} are each an alkyl group, an aryl group or an alkenyl group which may be substituted; and Z_4 is an atom or a group that is eliminated upon coupling; and

Formula (IV)



wherein R_{11}, R_{12} and R_{13} are each a hydrogen atom, a halogen atom, an alkyl group, an aryl group, an alkoxy group, an aryloxy group, an alkenyl group, a nitro group or a hydroxyl group.

4,456,682

SILVER HALIDE COLOR PHOTOGRAPHIC MATERIAL

Takatoshi Ishikawa; Akio Mitsui; Masakazu Morigaki, and Takashi Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 21, 1982, Ser. No. 420,689

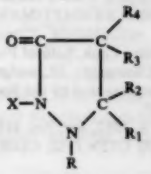
Claims priority, application Japan, Sep. 21, 1981, 56-149077

Int. Cl.^{3} G03C *7/00*

U.S. Cl. 430—523 **11 Claims**

1. A silver halide color photographic material, comprising: a support base having thereon; a substantially light-insensitive silver halide emulsion in a hydrophilic collodial layer which does not contain any light-sensitive silver halide; a light-sensitive silver halide emulsion layer; a color coupler and a compound represented by the following general formula (I):

(I)



wherein X is H or an acetyl group; R is an aryl group; and R_1, R_2, R_3 and R_4 independently represent a hydrogen atom, an alkyl group or an aryl group.

4,456,683

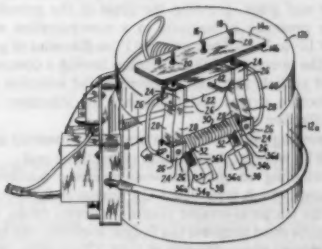
STERILIZABLE TISSUE SQUEEZING DEVICE AND METHOD

Philip M. Lintilhac, Lakeview Ter., Waterbury Center, Vt. 05677, and Thompson B. Vesecky, 20 Booth St., Burlington, Vt. 05401

Filed Nov. 30, 1982, Ser. No. 445,422

Int. Cl.^{3} C12Q *3/00*; C12M *1/36*, *3/00*; C12N *5/00*

U.S. Cl. 435—3 **10 Claims**



1. A method of selectively applying direct mechanical force to living tissue in a sterile culture whereby the plane of cell division of said tissue is manipulated, comprising the steps of:

(a) selecting a preset level of force to be applied to said tissue;

(b) exerting a direct mechanical force on said tissue;

(c) producing a signal indicative of said direct force;

(d) comparing a signal indicative of said preset level of force with said signal indicative of said direct force and determining any discrepancy therebetween;

(e) generating a signal which corresponds to said discrep-

ancy to adjust said direct mechanical forces to said preset level of force; and

thereafter repeating continuously steps b–e above, whereby said actual direct mechanical force applied to said living tissue continuously substantially approximates said preset level of force.

2. A tissue squeezing device comprising

a forcing frame means including tissue interface members, and

a bellows assembly means provided on said forcing frame means and including means for selectively moving said tissue interface members toward and away from each other to apply direct mechanical force to living tissue in sterile culture located between said tissue interface members, whereby new walls generated by active cell division are aligned with the force applied to said tissue through natural cellular regulatory process.

4,456,684

METHOD FOR SCREENING BACTERIA AND APPLICATION THEREOF FOR FIELD CONTROL OF DISEASES CAUSED BY *GAEUMANNOMYCES GRAMINIS*

David M. Weller; R. James Cook, both of Pullman, Wash., and Henry T. Wilkinson, Champaign, Ill., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 8, 1982, Ser. No. 415,778

Int. Cl.³ C12Q *1/20*; C12N *1/00*; C12R *1/39, 1/645*

U.S. Cl. 435—34 25 Claims

1. A method for screening bacteria for selection of strains which will suppress under field conditions diseases caused by the fungus *Gaeumannomyces graminis* (Gg), which comprises:

(a) isolating strains of potentially-suppressive bacteria from roots of plants of the variety to be protected grown in soil containing added Gg inoculum;

(b) screening strains isolated in the previous step for suppression of disease-causing Gg fungus in the greenhouse as follows:

(1) if the plants to be protected are cereal crops, growing the plants in the greenhouse in the presence of bacteria in a concentration of about 1×10^7 to 2×10^8 bacteria per seed or about 1×10^6 to 1×10^7 bacteria per gram of soil and in the presence of Gg inoculum having a concentration and particle size which optimizes the selection of field-effective strains and minimizes the selection of field-ineffective strains; or if the plants to be protected are turf grass, growing the grass in the greenhouse in the presence of bacteria in a concentration of about 2×10^7 to 2×10^9 bacteria per 1-cm diameter of grass and in the presence of Gg inoculum having a concentration and particle size which optimizes the selection of field-effective strains and minimizes the selection of field-ineffective strains;

(2) growing plants of the variety to be protected as in step (b)(1), without the addition of bacteria; and

(3) selecting as greenhouse-suppressive bacteria those strains which suppressed Gg fungus as follows:

if the bacterial-treated plants are cereal crops, the bacteria must suppress Gg fungus such that the bacterial-treated plants average at least 0.3 cm taller or at least 0.5 units less root disease than plants grown without added bacteria, or if the bacterial-treated plants are turf grass, the bacteria must suppress Gg fungus such that the bacterial-treated grass averages at least 5 percent more root or foliage dry weight than grass grown without added bacteria; and

(c) screening the so-selected bacteria of step (b)(3) for suppression of disease-causing Gg fungus in the field as follows:

(1) if the plants to be protected are cereal crops, growing the plants in the field in the presence of the so-selected strain of bacteria of step (b)(3) in a concentration of about $1'10^7$ to 2×10^8 bacteria per seed and in the presence of Gg inoculum in a concentration which optimizes the selection of field-effective strains and minimizes the selection of field-ineffective strains; or if the plants to be protected are turf grass, growing the grass in the presence of the so-selected strain of bacteria of step (b)(3) in a concentration of about 1×10^{10} to 1×10^{12} bacteria per square meter of grass and in the presence of Gg inoculum in a concentration which optimizes the selection of field-effective strains and minimizes the selection of field-ineffective strains;

(2) growing in the field plants of the variety to be protected as in step (c)(1) without the addition of bacteria; and

(3) selecting as field-suppressive bacteria those strains which suppressed Gg fungus as follows:

if the bacterial-treated plants are cereal crops, the bacteria must suppress Gg fungus such that the crops are 1.0 cm taller or grow 5 percent more heads or have 0.1 units less root disease than plants grown without added bacteria, or if the bacterial-treated plants are turf grass, the bacteria must suppress Gg fungus such than the bacterial-treated grass averages at least 5 percent less yellowed area or averages at least 5 percent more root or foliage dry weight than grass grown without added bacteria.

4,456,685

MICROORGANISMS IMMOBILIZED WITH HYDROLYSIS RESISTANT POLYURETHANE FOAM

James L. Guthrie, Ashton, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Aug. 23, 1982, Ser. No. 410,373

Int. Cl.³ C12P *13/20*; C12N *11/08, 11/04*

U.S. Cl. 435—109 19 Claims

1. A water insoluble, hydrolysis resistant, hydrophilic polyether polyurea polyurethane foam having aspartase-producing microorganisms bound to the foam prepared by reacting under foaming conditions an aqueous mixture containing a culture of aspartase-producing microorganisms and a hydrophilic polyether polyurethane prepolymer, said foam having a weight ratio of polyurea polyurethane polymer to microorganisms in the foam ranging from about 2 to about 4, a weight ratio of prepolymer to water is from about 2 to about 0.5, and said prepolymer having an isocyanate functionality in excess of 2 but not greater than 8 with at least 50 mole % of the alkylene oxide units in the polyether segments of the polyurethane being ethylene oxide, and obtained by reacting a poly(oxy-C_{2-4}alkylene) diol having at least about 50% by weight of oxyethylene groups.

a diphenylmethane diisocyanate-containing isocyanate product with a functionality of greater than 2.0 comprising a mixture of diphenylmethane diisocyanate and isocyanate containing derivatives of diphenylmethane diisocyanate, and

a polyol cross-linking agent having 3 or 4 hydroxyl equivalents per mole.

4,456,686

ANTIBIOTIC PA-39504-X_1 AND PRODUCTION THEREOF

Kentaro Tanaka; Eiji Kondo; Kouichi Matsumoto; Jun'ichi Shoji, all of Osaka, and Naoki Tsuji, Hyogo, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

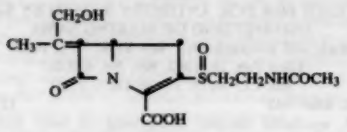
Division of Ser. No. 211,715, Dec. 1, 1980, Pat. No. 4,362,665. This application Sep. 22, 1982, Ser. No. 421,580

Claims priority, application Japan, Dec. 12, 1979, 54-161170

Int. Cl.³ C12P *17/18*; C12R *1/465*

U.S. Cl. 435—119 4 Claims

1. A process for producing an antibiotic PA-39504-X_1 of the formula:



which comprises cultivating *Streptomyces argenteolus* PA-39504- or *Streptomyces tokunonensis* PA-31088, or a mutant or a variant thereof under aerobic conditions and isolating the accumulated antibiotic PA-39504-X_1 from the cultured broth.

4,456,687

AGENTS FOR PROMOTING GROWTH OF EPITHELIAL CELLS

Howard Green, Brookline, Mass., assignor to President and Fellows of Harvard College, Cambridge, Mass.

Continuation of Ser. No. 961,444, Nov. 16, 1978, abandoned. This application Dec. 1, 1980, Ser. No. 211,921

Int. Cl.³ C12N *5/02*

U.S. Cl. 435—241 **13 Claims**

1. A method of promoting growth of human epithelial cells in culture comprising contacting said cells with an effective growth-promoting amount of an agent capable of increasing cellular cyclic-AMP and cell multiplication.

7. In a method for serially culturing epithelical cells, including the steps of forming a culture of epithelial cells in a culture medium containing fibroblast cells treated to prevent their multiplication and at a density sufficient to allow epithelial colonies to grow, maintaining said culture under conditions conducive to cell growth whereby epithelial colonies are formed, harvesting said epithelial colonies, and serially replating said epithelial cells into subcultures:

the improvement comprising supplying an effective growth-promoting amount of an agent capable of increasing cellular cyclic-AMP to said culture.

8. The improvement of claim 7 wherein said agent is selected from the group consisting of cholera toxin, methyl isobutyl xanthine and isoproterenol.

4,456,688

MICROBIOLOGICAL DESULFURIZATION OF COAL

Patrick R. Dugan, Columbus, and William A. Apel, Cincinnati, both of Ohio, assignors to The Ohio State University, Columbus, Ohio

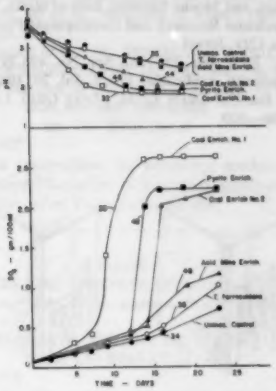
Filed Jul. 28, 1978, Ser. No. 929,214

Int. Cl.³ C07G *17/00*; C10G *32/00*

U.S. Cl. 435—267 **27 Claims**

1. A method for reducing the pyritic sulfur content of coal comprising the steps of:

providing an inoculant comprised of a mixture of autotrophic *acidophilic Thiobacilli* and acid tolerant heterotrophic microorganisms, said heterotrophic microorganisms derived from cultures originating in coal-bearing environments from where coal is produced, said Thiobacilli and said heterotrophic microorganisms being cultured under acidic conditions for enrichment so as to provide said inoculant with said Thiobacilli and heterotrophic microorganisms in an amount effective to evoke substantial reduction of the sulfur content of said coal; and



contacting said coal in comminuted form with an aqueous dispersion of said inoculant under conditions effective to substantially reduce the sulfur content thereof.

4,456,689

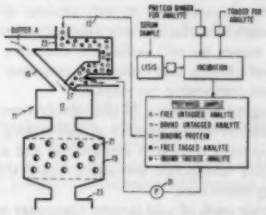
COMPETITIVE PROTEIN BINDING ASSAY USING AN ORGANOSILANE-SILICA GEL SEPARATION MEDIUM

Thomas R. Witty, Sandy, and Mark E. Astill, Holladay, both of Utah, assignors to Becton Dickinson and Company, Paramus, N.J.

Filed May 17, 1982, Ser. No. 379,227

Int. Cl.³ G01N *33/58, 33/60, 33/74, 33/78*

U.S. Cl. 436—500 **13 Claims**



1. An improved competitive protein binding assay comprising;

incubating an analyte in the presence of labeled analyte and a protein binder suitable for competitive binding activity by said analyte and said labeled analyte to provide a mixture having free analyte, free labeled analyte, bound analyte and bound labeled analyte,

substantially separating said bound analyte and said bound labeled analyte from said free analyte and free labeled analyte to form a first fraction containing substantially said bound analyte and said bound labeled analyte and a second fraction containing substantially said free analyte and said free labeled analyte by causing a predetermined level of said mixture to flow through a bed of an organosilane coupled to silica gel, and

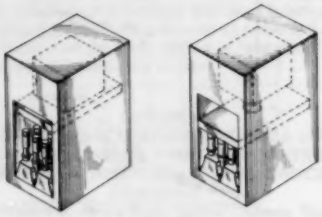
detecting the labeled analyte of at least one of said first and second fractions to determine the concentration of said analyte by comparison to a reference.

4,456,690

NON-CENTRIFUGATION METHOD FOR IMMUNOASSAY OF MATERIALS

Michael Cais, and Moshe Shimoni, both of Haifa, Israel, assignors to Technion Research and Development Foundation, Ltd., Technion City, Israel

Filed Jun. 29, 1982, Ser. No. 393,397
Claims priority, application Israel, Jul. 20, 1981, 63363
Int. Cl.³ G01N *33/58, 35/00*; G01T *1/00*
U.S. Cl. 436—500 22 Claims



1. A method for carrying out an immunoassay with a liquid-liquid extraction using a first liquid which is substantially immiscible with a second liquid, said method being carried out in a device comprising a mixing reservoir; a mixer-separator means, snuggly fitted into said mixing reservoir for sliding movement therein and having at least one unobstructed channel traversing the vertical axis thereof and opening into said mixing reservoir; and a collection container at the end of said mixer-separator means opposite said unobstructed opening, for thoroughly mixing the two liquids in response to at least one movement of said mixer-separator means into and out of said mixing reservoir by an amount sufficient to cause a substantial portion of both liquids to be transported through said channel into said collection container and back into said mixing reservoir and for subsequently separating the first liquid from the second liquid in response to controlled movement of said mixer-separator means into said mixing reservoir to a distance sufficient to transport the desired amount of the less dense liquid through said channel into said collection container; and a stopper means on said collection container for selectively opening and closing said collection container to the outside, said method comprising the steps of:

(a) arranging a plurality of the mixing reservoirs in a rack designed to hold a number of said mixing reservoirs;

(b) introducing a reagent and analyte and at least one substantially immiscible extracting liquid into each of said mixing reservoirs;

(c) capping each of said mixing reservoirs with one of said mixer-separator means;

(d) allowing the reagents and analytes to incubate for a required period of time in the mixing reservoirs capped with the mixer-separator means;

(e) placing the rack carrying the capped devices with the incubated reagents and analytes into a press-device designed to perform at a controlled rate a downward and upward movement whereby the mixer separator means are reciprocated in the mixing reservoirs at a chosen rate and for a preselected distance sufficient to complete the desired mass-transport and separation operations;

(f) operating the downward movement of said press-device at the preselected rate and distance sufficient to separate the upper immiscible phase from the lower phase;

(g) removing the rack upon the disengagement of the press-device; and

(h) placing the separator devices into the desired analytical instrument for a quantitative or qualitative measurement of either one, or both, of the separated phases.

4,456,691

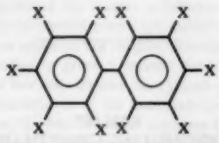
ANTIGEN FOR PCB, ANTIBODY RAISED BY SAME, AND METHOD OF MAKING SAME

Suad Stark, 395 Riverside Dr., New York, N.Y. 10025

Filed Feb. 28, 1983, Ser. No. 470,497
Int. Cl.³ A61K *39/00*; C07G *7/00*
U.S. Cl. 436—543 12 Claims

1. A synthetic antigen comprising at least one polychlorinated biphenyl hapten bonded covalently through an azo-containing linking group to a macromolecule carrier which confers antigenicity.

4. The antigen of claim 1 wherein said antigen has the formula



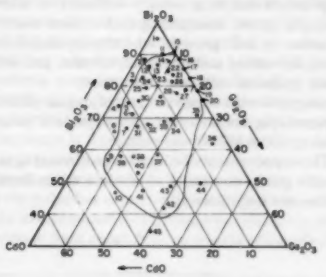
where X is selected from the class consisting of hydrogen, chlorine, or —N=N— carrier, at least 2 of said X being chlorine and at least 1 of said X being —N=N— carrier.

4,456,692

BI_2O_3—GA_2O_3 GLASSES

William H. Dumbaugh, Jr., Painted Post, and Brian P. Tyndell, Beaver Dams, both of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Sep. 26, 1983, Ser. No. 535,895
Int. Cl.³ C03C *3/12, 3/30*
U.S. Cl. 501—41 4 Claims



1. An infrared transmitting glass consisting essentially, expressed in terms of weight percent on the oxide basis, of about

Bi_2O_3	40–90
Ga_2O_3	5–30
CdO	0–35

4,456,693

HYDROCRACKING CATALYST

William A. Welsh, Fulton, Md., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 356,127, Mar. 8, 1982, abandoned. This application Apr. 18, 1983, Ser. No. 486,089
Int. Cl.³ B01J *29/12*
U.S. Cl. 502—65 6 Claims

1. A process for preparing hydrocracking catalyst which contains:

(1) a palladium/rare earth ultrastable type Y zeolite which contains from about 0.1 to 2 weight percent Pd and 0.5 to 8 weight percent RE_2O_3, (2) an inorganic oxide matrix and (3) from about 5 to 30 weight percent H_2O comprising the steps:
(a) forming said zeolite and matrix into catalyst particles;
(b) drying said catalyst particles at a temperature of from about 400° to 600° C. to obtain particles having a moisture content below about 3 weight percent; and
(c) rehydrating the catalyst particles prior to use in a hydrocracking process to obtain the moisture level set forth at (3).

4,456,694

CATALYSTS FOR PRODUCING ALCOHOLS FROM OLEFINS AND SYNTHESIS GAS

M. W. Blaskie, Shaker Hts.; J. R. Fox, Solon, and F. A. Pesa, Aurora, all of Ohio, assignors to Standard Oil Company, Ohio

Division of Ser. No. 332,036, Dec. 18, 1982, Pat. No. 4,361,711. This application Sep. 29, 1982, Ser. No. 427,071

Int. Cl.³ B01J *29/10, 21/08, 23/46*

U.S. Cl. 502—74 **7 Claims**

1. A catalyst comprising a solid oxide complex of the formula

$$A_aRhO_x$$

wherein
A is Fe, Zn, Ir, Ru, Nb, Cr, Mn and/or Pt;
a is 0.001 to 10; and
x is greater than zero but less than a number sufficient to satisfy the valence requirements of the other elements present when in a fully oxidized state.

4. The catalyst of claim 1 wherein the catalyst is disposed on a catalyst support.

5. The catalyst of claim 4 wherein the catalyst support is at least one of silica, alumina, zirconia, kieselguhr, titania and molecular seives.

4,456,695

COMPONENT OF CATALYST FOR OLEFIN POLYMERIZATION

Hitoshi Nimura; Makoto Kono, and Shinichi Yoshida, all of Ibaraki, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Aug. 20, 1982, Ser. No. 409,858

Claims priority, application Japan, Aug. 20, 1981, 56-130729

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—104 **10 Claims**

1. A component of a catalyst for polymerization of olefins which component is a contact product of:
a component A which is a solid product obtained by mixing a solution of components (1) and (2) and 0.05 to 5 mols of a precipitant which comprises titanium tetrachloride per mol of the component (1) in the copresence of a component (3) thereby to produce a solid product and washing the solid product with an aprotic organic solvent selected from the group consisting of hydrocarbons and halohydrocarbons to remove a soluble titanium component,
the component (1) being a magnesium compound represented by the formula $Mg(OR^1)_{2-n}X_n$, wherein R^1 is a hydrocarbyl having 1 to 12 carbon atoms, which is an alkyl, an aryl, an aralkyl or a cycloalkyl, or a haloderivative thereof; X is a halogen; and n is a number satisfying $0<n\leqq 2$,
the component (2) being a titanium component represented by the formula $Ti(OR^2)_4$ or a polymer thereof, wherein R^2 is a hydrocarbyl having 1 to 12 carbon atoms, which is an alkyl, an aryl, an aralkyl or a cycloalkyl, or a haloderivative thereof, R_2 being the same as or different from R^1,
the component (3) being an electon-donor compound, and a compound B which is titanium tetrachloride.

4,456,696

CATALYST FOR MAKING POLYURETHANES

Francis W. Arbir, Itasca; Daniel S. Raden, Hawthorn Woods; Kenneth W. Narducy, Bloomingdale, and Francois M. Casati, Highland Park, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Continuation-in-part of Ser. No. 252,634, Apr. 9, 1981, Pat. No. 4,421,673. This application Oct. 21, 1982, Ser. No. 435,843

The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.

Int. Cl.³ B01J *31/04*

U.S. Cl. 502—167 **4 Claims**

1. A catalyst composition for preparing urethane foams, comprising a physical mixture of a tertiary amine and 10-50 equivalent-% thereof of 2-ethylhexanoic acid.

4,456,697

CATALYSTS FOR ALKOXYLATION REACTIONS

Kang Yang, Ponca City, Okla., assignor to Conoco Inc., Ponca City, Okla.

Filed Sep. 23, 1982, Ser. No. 422,324

Int. Cl.³ B01J *27/12*

U.S. Cl. 502—171 **4 Claims**

1. Catalysts for alkoxylation reactions comprising HF and metal alkoxides and mixed metal alkoxides wherein the metal alkoxides have the general formula $M(OC_nH_{2n+1})_q$ wherein q is equal to the valence of M, each n is from 1 to 22, M is selected from the group consisting of aluminum, gallium, indium, thallium, zirconium, hafnium, titanium and mixtures thereof.

4,456,698

RAPID CURING EPOXY COMPOSITIONS

Thomas F. Brownscombe, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 330,412, Dec. 14, 1981, Pat. No. 4,396,754. This application Mar. 28, 1983, Ser. No. 480,183

Int. Cl.³ B01J *21/02, 27/02, 27/06*

U.S. Cl. 502—203 **10 Claims**

1. A catalyst composition suitable for the rapid curing of epoxy compositions prepared by blending (1) a lithium salt of a non-nucleophilic acid, (2) a solvent and (3) a finely divided inert inorganic material, and then, removing at least a portion of the solvent.

4,456,699

CATALYST AND SUPPORT, AND THEIR METHODS OF PREPARATION

Albert L. Hensley, Jr., Munster, Ind., and Leonard M. Quick, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 274,553, Jun. 17, 1981, Pat. No. 4,395,328. This application Apr. 15, 1983, Ser. No. 485,308

Int. Cl.³ B01J *27/14*

U.S. Cl. 502—208 **26 Claims**

1. A method for preparing an improved catalyst support from a composite comprising alumina and one or more oxides of phosphorus, which method comprises forming said composite into a shaped catalyst support material having a selected shape and at least 0.8 cc/gm of its pore volume in pores having diameters of 0 nm (0 Å) to 120 nm (1,200 Å) and at least 0.1 cc/gm of its pore volume in pores having diameters of 120 nm (1,200 Å) to 5,000 nm (50,000 Å) and heating said shaped catalyst support material in the presence of steam at sufficient elevated temperature, steam pressure, and time period to increase the average pore diameter of said shaped catalyst support material in the absence of any appreciable reduction in pore volume, so as to provide a steam-treated support material having an average pore diameter of at least 18 nm (180 Å) and a surface area below 200 m^2/gm.

4,456,700

CATALYST FOR RESIDUA DEMETALATION AND DESULFURIZATION

Stephen M. Oleck, Moorestown, and Howard S. Sherry, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 404,786, Aug. 3, 1982, which is a continuation of Ser. No. 42,659, May 25, 1979, abandoned, which is a continuation-in-part of Ser. No. 714,145, Aug. 13, 1976, abandoned. This application Nov. 12, 1982, Ser. No. 440,926

Int. Cl.³ B01J *21/04, 23/85, 23/88*

U.S. Cl. 502—220 8 Claims

1. A hydrometalation-desulfurization catalyst comprising a hydrogenating component which comprises a Group VI-B metal oxide or sulfide and a Group VIII metal oxide or sulfide composited with a porous alumina base, said catalyst having at least about 25% of the volume of the pores with a diameter within the range of about 0 to 30 Å, at least about 50% of the volume of the pores with a diameter within the range of about 0 to 100 Å and further having a pore volume of from about 0.80 to about 0.95 cc/gram and an average pore diameter of about 145 Å to about 170 Å and a surface area of about 180 m^2/gram to about 220 m^2/gram.

4,456,701

HYDROPROCESSING CATALYST HAVING BIMODAL PORE DISTRIBUTION AND PROCESS FOR PREPARING THE CATALYST

Hong C. Chen, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 158,017, Jun. 9, 1980. This application Jan. 31, 1983, Ser. No. 462,637

Int. Cl.³ B01J *21/04, 21/08, 23/85*

U.S. Cl. 502—221 18 Claims

1. A hydroprocessing catalyst comprising a rigidly interconnected pack containing inorganic matrix oxide and about 10–95% by weight of fluid catalytic cracking catalyst microspheroids, based on the total weight of said matrix oxide and said microspheroids, said pack being characterized by having a pore volume of at least 0.15 cc per cc, at least about 30% of said pore volume being present in pores having diameters within the range of 50–250 Angstroms, and at least about 5% of said pore volume being present in pores having diameters greater than 1000 Angstroms.

4,456,702

ABATEMENT SCREEN CATALYST

Joseph H. Keller, West Chester, and Fred G. Baur, Valley Forge, both of Pa., assignors to Met Pro Corporation, Harleysville, Pa.

Filed Jul. 19, 1982, Ser. No. 399,849

Int. Cl.³ B01J *21/04, 23/56, 23/86, 23/89*

U.S. Cl. 502—314 17 Claims

1. A catalyst assembly for reducing the odors and atmospheric contaminants emitted by nonvented kerosene heaters comprising:

a metallic screen having a catalytic material directly coated thereon substantially covering its surface, and wire support means for direct attachment of said coated screen to such heaters for suspending the coated screen within such kerosene heaters for catalytic combustion of hydrocarbons and carbon monoxide.

4,456,703

HIGH SURFACE AREA NICKEL ALUMINATE SPINEL CATALYST FOR STEAM REFORMING

Clyde L. Aldridge, Baton Rouge, La., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed May 7, 1982, Ser. No. 375,828

Int. Cl.³ B01J *21/04, 23/74*

U.S. Cl. 502—335 13 Claims

1. A composition comprising a nickel aluminate spinel on an alumina support, said composition having been prepared by the steps which comprise:

(a) subjecting an alumina having a high surface area to at least one impregnation with a nickel component in a liquid medium;

(b) drying the nickel-impregnated alumina;

(c) calcining the dried nickel-impregnated alumina at a temperature ranging from about 600° C. to about 900° C., and

(d) recovering a composition comprising nickel aluminate spinel on an alumina support, said composition having a BET surface area of at least about 94 m^2/g.

4,456,704

PRODUCTION OF FOAM

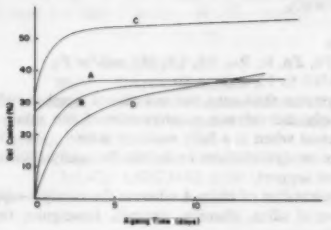
Mikio Fukumura; Hideo Shibata, both of Nara; Shubei Doi, Yokkaichi; Tsutomu Isaka, Yokkaichi, and Takayuki Inoue, Yokkaichi, all of Japan, assignors to Sekisui Kaseihin Kogyo Kabushiki Kaisha, Nara, Japan

Filed Oct. 8, 1982, Ser. No. 433,383

Claims priority, application Japan, Oct. 8, 1981, 56-160720

Int. Cl.³ C08J *9/06, 9/14*

U.S. Cl. 521—79 18 Claims



1. A method for producing crosslinked polyethylene which consists essentially of:

mixing a polyolefin resin and a blowing agent under pressure, the polyolefin containing a crosslinkable ethylene polymer having silyl groups on the side chains thereof, the silyl groups effecting crosslinking on contact with water;

extruding the mixture into a low pressure zone, whereby the extrudate is expanded; and thereafter

contacting the expanded extrudate with a silanol condensing catalyst, and crosslinking the expanded extrudate by contacting with water.

4,456,705

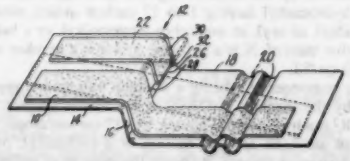
HEAT FUSIBLE-EXPANDABLE MASTIC FOR AUTOMOBILE FLOOR PANS

Bruce C. McCarthy, Newburyport, Mass., assignor to USM Corporation, Farmington, Conn.

Filed Dec. 31, 1981, Ser. No. 336,091

Int. Cl.³ C08J *9/00*

U.S. Cl. 521—83 11 Claims



1. A mastic material softenable into conformnity and adhesive engagement with a contoured metal surface but resistant

to flow and comprising from about 25 to about 65 percent by weight of the mastic material of mineral filler, from about 2 to about 15 percent by weight of an elastomer, from about 2 to about 20 percent by weight of asphalt from about 20 to about 60 percent by weight of a polymeric modifier and, an effective amount of a heat activatable foaming agent.

4,456,706

MOLDING COMPOUNDS, SPONGE ARTICLES PRODUCED THEREFROM AND PROCESS OF PRODUCTION

Roy W. Siedenstrang, and Agmund K. Thorsrud, both of Stow, Ohio, assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 236,344, Feb. 20, 1981, Pat. No. 4,352,854, which is a continuation-in-part of Ser. No. 134,829, Mar. 28, 1980, abandoned. This application Jul. 19, 1982, Ser. No. 399,532

The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.

Int. Cl.³ C08J *9/10*; C08L *53/02*

U.S. Cl. 521—89 **4 Claims**

1. A molding composition comprising:

(a) vinyl-substituted aromatic compounds containing from 8–18 carbon atoms copolymerized with conjugated diene having from 4–12 carbon atoms,

(b) resinous solid polymer of vinyl-substituted aromatic compound in the range of about 10 to about 60 parts resinous polymer per 100 parts said copolymer,

(c) polarizing agent, and

(d) blowing agent in an amount in the range of about 6 to about 10 parts by weight per 100 parts by weight of thermoplastic polymer, said amount sufficient to produce upon activation and molding an article of rubbery, sponge-like porosity surrounded by a thin, dense skin.

4,456,707

PROCESS FOR THE PRODUCTION OF FIBER-CONTAINING POLYURETHANE MOLDINGS HAVING INHOMOGENEOUSLY COLORED SURFACES

Lothar Hille, Leverkusen; Heimo Lüdke, Berg.-Gladbach, and Nikolaus Hansjosten, Pluwig, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Apr. 11, 1983, Ser. No. 484,067

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1982, 3215260

Int. Cl.³ C08L *75/04*

U.S. Cl. 521—99 **5 Claims**

1. A process for the production of a fiber-containing polyurethane molding which has an attractive inhomogeneously colored surface with color contrasts in fiber-like distribution comprising:

(a) mixing with at least one starting component for the production of polyurethane colored fibers or fiber blends having a staple length of from 0.1 to 6 mm and a denier of from 0.1 to 25 dtex which fibers have coloring components that do not bleed out or dissolve in the starting materials from which the polyurethane is made in a quantity such that the fibers are from 0.1 to 10 wt. % of the fiber-containing reaction mixture; and

(b) reacting the starting component for the production of polyurethane of (a) into which the fibers have been mixed with the necessary remaining polyurethane-forming component in a closed mold.

4,456,708

METHOD FOR THE PREPARATION OF THIN-SKINNED ASYMMETRIC REVERSE OSMOSIS MEMBRANES AND PRODUCTS THEREOF

Theodore J. Wydeven, Sunnyvale, Calif., and Moshe G. Katz, Givataim, Israel, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 25, 1982, Ser. No. 392,092

Int. Cl.³ C08F *16/06*

U.S. Cl. 521—141 **16 Claims**

1. The method of preparing a thin-skinned asymmetric water-insoluble membrane comprising the steps of:

(a) casting a layer of water-soluble polymer selected from the group consisting of poly(vinyl alcohol), vinyl acetatevinylalcohol copolymers containing from 25 to 100 mer % of vinyl alcohol groups, water-soluble vinyl alcohol-vinyl ether copolymers, poly(ethyleneimine), poly(-vinylpyrrolidone) and poly(vinylamine) from a water solvented casting solution;

(b) exposing the layer to 15° C. to 100° C. and 25% to 75% humidity for 5 to 2,000 seconds to form a thin-skinned asymmetric-structured film;

(c) contacting the asymmetric-structured film with an aqueous bath containing from 3 to 40% by weight of a salt of a polyvalent transition metal selected from the metals of Periods 4, 5 and 6 in Groups IVB, VIIB, VIIIB and IIB thereby fixing the thin-skinned asymmetric structure and forming a water-insolubilized film.

4,456,709

POLYISOCYANATE MIXTURES, PROCESS FOR THEIR PRODUCTION AND THEIR USE IN THE PRODUCTION OF POLYURETHANE PLASTICS

Roland Richter; Hans Hettel, both of Cologne, and Hanns P. Müller, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 23, 1983, Ser. No. 554,662

Claims priority, application Fed. Rep. of Germany, Dec. 1, 1982, 3244407

Int. Cl.³ C08G *18/14*, *18/79*

U.S. Cl. 521—160 **6 Claims**

1. A polyisocyanate mixture which is liquid and storable at room temperature and which has an isocyanate content of from 36.5 to 45% by weight, consisting essentially of

(a) from 25 to 70 parts by weight of a mixture having an NCO-content of from 22 to 36% by weight of (i) isocyanurate-group-containing trimers of 2,4-diisocyanatotoluene and (ii) 2,4-diisocyanatotoluene and

(b) from 30 to 75 parts by weight of 2,4- and/or 2,6-diisocyanatotoluene.

6. In a method of manufacturing a polyurethane and/or polyurea product by reacting an isocyanate with an active hydrogen containing material, the improvement wherein the isocyanate used is

(a) from 25 to 70 parts by weight of a mixture having an NCO-content of from 22 to 36% by weight of (i) isocyanurate-group-containing trimers of 2,4-diisocyanatotoluene and (ii) 2,4-diisocyanatotoluene and

(b) from 30 to 75 parts by weight of 2,4- and/or 2,6-diisocyanatotoluene.

4,456,710

FILLER-CONTAINING PLASTIC MOLDING COMPOSITION, A PROCESS FOR ITS PREPARATION, AND ITS USE

Walter Lüders, Neu-Isenburg, and Karlheinz Burg, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 13, 1982, Ser. No. 449,160

Claims priority, application Fed. Rep. of Germany, Dec. 29, 1981, 3151814

Int. Cl.³ C08K 3/26, 5/42

U.S. Cl. 523—200 8 Claims

1. A molding composition comprising 90–20 parts by weight of a polymer consisting of a polyoxymethylene polymer, 10–80 parts by weight of an alkaline earth metal carbonate, and a discoloration-reducing amount within the range of 0.1–10 parts by weight, relative to the alkaline earth metal carbonate, of an adhesion promoter, which contains as adhesion promoter a sulfur-organic compound of the formula

$$R—SO_3—Me \quad (I)$$

in which R represents the following radicals:

straight-chain or branched alkyl radical having 6 to 35 carbon atoms or a cycloalkyl radical or alkenyl radical each having 6 to 22 carbon atoms, and the alkenyl radical contains at least one double bond and all these radicals can be substituted by hydroxyl groups or the radicals —O-COR¹ or —COOR¹ in which R¹ represents a straight-chain or branched alkyl radical having 1 to 6 carbon atoms,

an alkylaryl radical having 7 to 22 carbon atoms and which can be substituted in the above manner,

$R^2—O(CH_2CH_2O)_m—$ in which R^2 denotes an alkyl radical having 6 to 22 carbon atoms and m denotes 1 to 4,

$R^2—CO—O—(CH_2)_n—$ in which R^2 has the above meaning and n is equal to 2 to 6,

$$R^2—CO—N(R^3)—(CH_2)_n$$

in which R^2 and n have the above meaning and R_3 represents hydrogen or a straight-chain or branched alkyl radical having 1 to 6 carbon atoms,

and Me denotes an alkali metal ion or alkaline earth metal cation.

4,456,711

PROCESS FOR THE PREPARATION OF A POWDER MIXTURE FOR SURGICAL USE

Hanns Pietsch, Hamburg; Volker Hohmann, Norderstedt, and Willi Eckloff, Hamburg, all of Fed. Rep. of Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Filed Jul. 14, 1982, Ser. No. 397,957

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1981, 3128923

Int. Cl.³ C08K 9/00

U.S. Cl. 523—206 6 Claims

1. In a process for the preparation of a powder mixture which comprises combining a polymerization initiator with a methylmethacrylate homopolymer and/or copolymer powder and an X-ray contrast medium, the improvement wherein the initiator is mixed with either the polymer powder or the X-ray contrast medium under conditions whereby the initiator coats said polymer powder or said X-ray contrast medium and, subsequently mixing the remainder of the ingredients".

4,456,712

BISMALEIMIDE TRIAZINE COMPOSITION

Frederick R. Christie, Endwell, and Lawrence R. Daley, Binghamton, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 388,316, Jun. 14, 1982, abandoned. This application Apr. 26, 1983, Ser. No. 488,830

Int. Cl.³ C08L 63/00

U.S. Cl. 523—439 14 Claims

1. A composition consisting essentially of:

(a) about 70 to about 80% by weight of bismaleimide triazine polymeric component wherein said bismaleimide triazine polymeric component is from bisphenol-A-dicyanate and the bis-imide of 4,4'-diaminodiphenyl methane and maleic anhydride;

(b) about 20 to about 30% by weight of a brominated epoxy polymeric component wherein said brominated epoxy polymeric component is a tetrabrominated diglycidyl ether of bisphenol A and contains at least 45% by weight of bromine; and

(c) solvent in an amount of about 10 to 70% by weight based upon the total weight of (a), (b), and (c) in the composition.

4,456,713

COMPOSITION FOR INJECTION MOLDING

Kenneth W. French, Merrimack, N.H.; Jeffrey T. Neil, E. Pepperell, and Larry L. Turnbaugh, West Roxbury, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 20, 1982, Ser. No. 450,960

Int. Cl.³ C08K 5/09, 5/01

U.S. Cl. 523—455 12 Claims

1. A composition suited to be injection molded comprising at least 55 percent by volume of a finely divided sinterable material; and

an organic binder composition comprising

from about 80 to about 90 percent by weight of a hydrocarbon wax having a melting point from about 40° C. to about 75° C. and a volatilization temperature from about 150° C. to about 450° C.,

from about 5 to about 15 percent by weight of a thermosetting resin having a thermosetting temperature from about 120° C. to about 160° C., and

a surfactant.

4,456,714

MICROBIAL HETEROPOLYSACCHARIDE

Roger B. Cox, Reading, and David C. Steer, Wirral, both of England, assignors to Lever Brothers Company, New York, N.Y.

Division of Ser. No. 331,705, Dec. 16, 1981, which is a division of Ser. No. 166,220, Jul. 7, 1980, Pat. No. 4,329,448. This application Aug. 23, 1982, Ser. No. 410,778

Claims priority, application United Kingdom, Jul. 10, 1979, 7924040; Dec. 20, 1979, 7943878

Int. Cl.³ C08K 5/04; C09D 3/10, 5/04

U.S. Cl. 524—56 5 Claims

1. A water base paint comprising a latex rubber-like water base paint binder, a pigment, an aqueous vehicle for said binder and pigment, and containing Biopolymer PS 87 in an amount sufficient to give the paint pseudoplastic properties, said Biopolymer PS 87 being a heteropolysaccharide which comprises from 40 to 45% by weight of glucose, from 10 to 20% by weight galactose, from 25 to 30% by weight mannose, from 6 to 13% by weight glucuronic acid and from 0 to 1.5% by weight fucose, a 1% by weight solution of said Biopolymer PS 87 having pseudoplastic properties, a consistency at 20° C. of at least 150 poise and a yield stress value at 20° C. of at least 30 dynes/cm².

4,456,715
FLAMEPROOF POLYAMIDE MOULDING COMPOSITIONS

Ludwig Rottmaier, Odenthal; Rudolf Merten, Leverkusen, both of Fed. Rep. of Germany; Wolfgang Siebourg, Pittsburgh, Pa., and Burkhard Lachmann, Meerbusch, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,604

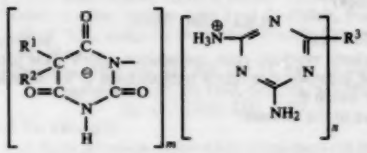
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1980, 3027617

Int. Cl.³ C08K *5/34*

U.S. Cl. 524—100 **4 Claims**

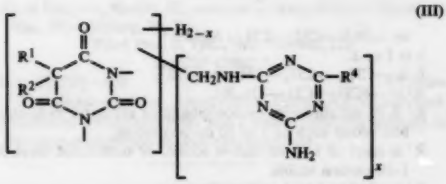
1. A self-extinguishing thermoplastic polyamide moulding composition which comprises a thermoplastic polyamide and from 0.1 to 20% by weight, based on the total composition, of a flame proofing agent selected from the group consisting of those of the formulae

(II)



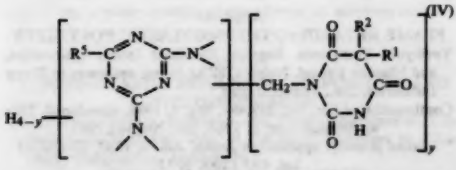
wherein R^1 and R^2, which may be the same or different, represent independently of each other hydrogen, a C_1–C_{10} aliphatic radical, a C_4–C_{10} cycloaliphatic radical, a C_7–C_{12} araliphatic radical or a C_6–C_{10} aromatic radical; R^3 is hydrogen, an amino group, an aliphatic C_1–C_{20} radical, a cycloaliphatic C_6–C_{17} radical, an araliphatic C_7–C_{17} radical, an aromatic C_6–C_{15} radical or one of said radicals substituted with halogen; n is 1 to 4 and m is 1 to n;

(III)

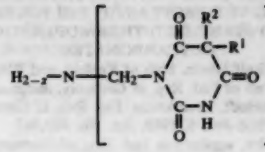


wherein R^1 and R^2 are as aforesaid, R^4 is hydrogen, an amino group, an aliphatic C_1–C_{20} radical, a cycloaliphatic C_4–C_{17} radical, an araliphatic C_7–C_{17} radical, an aromatic C_6–C_{15} radical or one of said radicals substituted with halogen, and x is 1 or 2 with the proviso that when x is 1, R^4 is an amino group and

(IV)



wherein R^1 and R^2 are as aforesaid, y is 1 to 4, R^5 is hydrogen, an aliphatic C_1–C_{20} radical, a cycloaliphatic C_4–C_{17} radical, an araliphatic C_7–C_{17} radical, an aromatic C_6–C_{15} radical, one of said radicals substituted with halogen or a radical of the formula



wherein R^1 and R^2 are as aforesaid and z is 1 or 2.

4,456,716
4-(HYDROXYPHENYLTHIO)IMIDE STABILIZERS

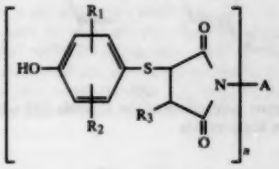
John D. Spivack, and Stephen D. Pastor, both of Spring Valley, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 29, 1982, Ser. No. 454,214

Int. Cl.³ C07D *207/416*; C08K *5/36*

U.S. Cl. 524—104 **17 Claims**

1. A compound of the formula



wherein

R_1 and R_2 independently are hydrogen, alkyl of 1 to 18 carbon atoms, cycloalkyl of 5 to 6 carbon atoms, phenyl or phenyl substituted by alkyl of 1 to 12 carbon atoms and R_1 is in the ortho position to the hydroxyl group in the phenyl ring;

R_3 is hydrogen or alkyl of 1 to 3 carbon atoms;

n is 1, 2 or 3;

when n is 1, A is phenyl, phenyl substituted by one or two alkyl groups of 1 to 18 carbon atoms, alkyl of 1 to 30 carbon atoms, cycloalkyl of 5 to 6 carbon atoms; E-(G-T)$_y$- where E is alkyl of 1 to 18 carbon atoms, G is —O— or —NH—, T is ethylene, propylene or 1,4-butylene and y is 1 to 30;

when n is 2, A is phenylene, phenylene substituted by one or two alkyl groups of 1 to 12 carbon atoms, alkylene of 1 to 12 carbon atoms, cycloalkylene of 5 to 6 carbon atoms, phenylene-L-phenylene where L is alkylene of 1 to 4 carbon atoms, or is —T—(G—T)$_z$— where T is ethylene, propylene or 1,4-butylene, G is —O— or —NH—, and z is 1 to 30; and

when n is 3, A is 1,2,3-benzenetriyl, 1,2,4-benzenetriyl, 1,3,5-benzenetriyl or N(—R_6—)$_3$ where R_6 is alkylene of 2 to 4 carbon atoms.

2. A method for stabilizing an organic material against oxidative, thermal and actinic degradation which comprises incorporating into said organic material an effective stabilizing amount of a compound of claim 1.

4,456,717

STABILIZER COMPOSITIONS, THEIR USE FOR STABILIZING THERMOPLASTIC, POLYCARBONATES AND STABILIZED THERMOPLASTIC POLYCARBONATES

Erich Elmers; Rolf Dhein, both of Krefeld, and Klaus Kircher, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 8, 1983, Ser. No. 502,357

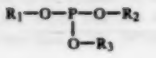
Claims priority, application Fed. Rep. of Germany, Jun. 16, 1982, 3222522

Int. Cl.³ C08K 5/15, 5/52

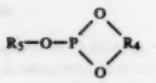
U.S. Cl. 524—109 **6 Claims**

1. A stabilizer composition comprising

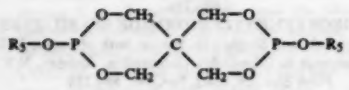
(a) a phosphite of the formula (I), (a, b, c, and/or d)



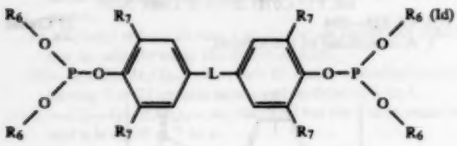
(Ia)



(Ib)



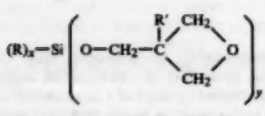
(Ic)



(Id)

with

(b) a siloxane compound of the formula (II) which is liquid at room temperature



(II)

wherein the equivalent weight per oxetane group is less than 180,

wherein

R_1, R_2 and R_3 are linear or branched C_1–C_{18}-alkyls or optionally substituted C_6–C_{20}-aryls with the proviso that at least one of the radicals R_1, R_2 or R_3 is an aryl radical;

R_4 is a C_2–C_5-alkylene or a divalent radical of a C_6–C_{30}-aryl ring system;

R_5 is a linear or branched C_1–C_{18}-alkyl, a C_5–C_{14}-cycloalkyl or a C_6–C_{20}-aryl radical, which may also contain alkyl and/or hydroxyl substituents, with the proviso that at least one C atom, which is directly bonded to the oxygen of the phosphorus acid, of each of the possible radicals R_4 and R_5 is a constituent of an aromatic ring;

R_6 is a substituted or unsubstituted C_6–C_{14}-aryl;

R_7 is H or C_1–C_4-alkyl;

—L— is —O—, a C_1–C_6-alkylidene or a single bond;

R is H or a linear or branched C_1–C_{14}-alkyl, which may contain ether oxygen atoms, a C_5–C_{14}-cycloalkyl, which may be alkyl-substituted, or a substituted or unsubstituted C_6–C_{14}-aryl;

R′ is a C_1–C_6-alkyl, a C_5–C_6-cycloalkyl or phenyl; and

x is 1 or 2, y is 2 or 3 and $x+y=4$,

and wherein the ratio of mixing of the siloxane component to the phosphite component corresponds to 1 to 10 oxetane-group equivalents per mole of phosphorus.

6. A stabilized aromatic thermoplastic polycarbonate comprising

(a) an aromatic thermoplastic polycarbonate and

(b) the stabilizer composition of claim 1

wherein component (b) is present in an amount from about 0.01 to 1% by weight relative to the total weight of the aromatic thermoplastic polycarbonate and the stabilizer composition.

4,456,718

ELASTIC SYNTHETIC-RESIN COMPOSITIONS WITH IMPROVED ADHESION CONTAINING A SILANE

Bernd Brinkmann, Nordkirchen, and Hermann-Josef Lucas, Ascheberg-Herbern, both of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Feb. 4, 1983, Ser. No. 463,704

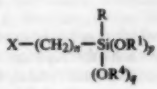
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1982, 3203687

Int. Cl.³ C08L 75/04

U.S. Cl. 524—114 **16 Claims**

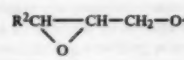
1. An elastic synthetic-resin composition which is the product of the incorporation into a polyurethane of an adhesion promoter which is

(a) a silane of the formula



wherein

X is —SH, —NHR^2,



or —(NH—CH_2—CH_2)$_b$ NHR^2,

b is 1 or 2,

R is —CH_3, —CH_2—CH_3 or —OR^1,

R^1 is —(CH_2—CH_2—O)$_m$$R^3$,

R^2 is H, an aliphatic, cycloaliphatic or aromatic hydrocarbon group each of 1 to 10 carbon atoms,

R^3 is alkyl of 1 to 10 carbon atoms, or substituted alkyl of 1–10 carbon atoms,

R^4 is alkyl of 1 to 4 carbon atoms,

n is a number from 1 to 8,

m is a number from 1 to 30,

p is ≥ 1, and

$q+p$ is ≤ 2; or

(b) an adduct of such a silane with a monomeric or prepolymeric compound containing NCO groups, said adduct containing at least one NCO group.

4,456,719

FLAME RETARDING THERMOPLASTIC POLYESTER

Yoshiyuki Yamamoto, Suzuka; Toshihide Inoue, Ichinomiya, and Masana Yanagi, Nagoya, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Continuation of Ser. No. 299,494, Sep. 4, 1981, abandoned. This application Apr. 4, 1983, Ser. No. 481,798

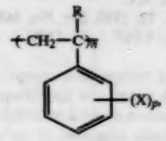
Claims priority, application Japan, Jan. 8, 1982, 57-130784

Int. Cl.³ C08K 5/15

U.S. Cl. 524—114 **9 Claims**

1. A flame retarding polyester composition which comprises (a) 3 to 45 parts by weight of a halogen containing polystyrene and/or a halogen containing poly-a-methystyrene represented by formula (I) given below, (b) 1 to 20 parts by weight of antimony trioxide, and (c) 0.1 to 10 parts by weight of epoxy

compound which are mixed with 100 parts by weight of a thermoplastic polyester selected from the group consisting of polyethylene terephthalate and polybutylene terephthalate,



(I)

wherein R represents a hydrogen atom or methyl group, X represents a bromine or chlorine atom, p is an integer of 1 to 5, and n is an integer larger than 2.

4,456,720

FLAME RESISTANT NON-DISCOLORED POLYPHENYLENE ETHER RESIN COMPOSITIONS

Visvaldis Abolins, Delmar, and Fred F. Holub, Schenectady, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 342,355, Jan. 25, 1982, abandoned. This application Aug. 29, 1983, Ser. No. 527,283

Int. Cl.³ C08K 5/56, 5/55

U.S. Cl. 524—176 22 Claims

1. A flame retardant composition which does not discolor on molding, comprising a polyphenylene ether resin and a flame retardant amount of a stable brominated-phenoxy alkane and a boron containing ester.

4,456,721

FLAME-RETARDED ACRYLONITRILE-BUTADIENE-STYRENE COPOLYMER COMPOSITIONS COMPRISING BIS(BETA-PENTABROMOPHENOXYETHYL) SUCCINATE

Yuval Halpern, Skokie, Ill., assignor to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Dec. 2, 1982, Ser. No. 446,123

Int. Cl.³ C08K 5/11

U.S. Cl. 524—288 5 Claims

1. A flame-retarded composition comprising an acrylonitrile-butadiene-styrene resin and a flame-retarding amount of bis(beta-pentabromphenoxyethyl) succinate.

4,456,722

COMPOSITION FOR CONTROL OF BACTERIA AND VIRUSES

Lary L. Foley, 4443 - 20th St., San Francisco, Calif. 94114

Filed Nov. 9, 1982, Ser. No. 440,395

Int. Cl.³ C08G 65/32; C08L 71/02

U.S. Cl. 524—413 7 Claims

1. An association complex formed by the combination of a hexamethylenetetramine quaternary salt of a halogenated allyl halide and a water-soluble homopolymer of ethylene oxide.

4,456,723

THERMOPLASTIC MOULDING COMPOSITION AND THE USE THEREOF

Franz Breitenfellner, Bensheim, and Thomas Kainmüller, Lindenfels, both of Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Oct. 21, 1982, Ser. No. 435,831

Claims priority, application Switzerland, Oct. 28, 1981, 6879/81

Int. Cl.³ C08K 3/26

U.S. Cl. 524—415 9 Claims

1. A moulding composition for casting, moulding or injection moulding, having improved tracking resistance which comprises

(a) 99.7 to 60% by weight of a thermoplastic polyester, and

(b) 0.3 to 40% by weight of a substantially water-free calcium phosphate.

4,456,724

ORGANIC PIGMENTS

William W. Maslanka, London-Britain Township, Chester County, Pa., and Gavin G. Spence, New Castle County, Del., assignors to Hercules Incorporated, Wilmington, Del.

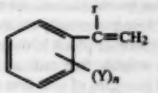
Division of Ser. No. 159,744, Jun. 16, 1960, Pat. No. 4,349,641, which is a division of Ser. No. 909,606, May 25, 1978, Pat. No. 4,235,982, which is a continuation-in-part of Ser. No. 803,330, Jun. 3, 1977, abandoned. This application Mar. 31, 1982, Ser. No. 364,150

Int. Cl.³ C08L 95/00

U.S. Cl. 524—458 6 Claims

4. A process for preparing a latex of graft copolymer particles which comprises graft copolymerizing in aqueous media and in the presence of a free-radical initiator (1) at least one ethylenically unsaturated monomer (a) and at least one polyethylenically unsaturated monomer (b) in an amount at least sufficient to provide cross linked graft copolymer particles, and (2) a water-insoluble cationic prepolymer having an RSV of about 0.1 to about 2.5 (1M NaCl, 1%, 25° C.),

said monomer (a) being selected from the group consisting of methyl alpha-chloroacrylate, ethyl alpha-chloroacrylate, methyl methacrylate, isopropyl methacrylate, phenyl methacrylate, vinyl chloride, acrylonitrile, methacrylonitrile, and monomers having the formula



wherein R is hydrogen or methyl, Y is methyl or chlorine, and n is 0, 1, 2, or 3, said monomer (b) being selected from the group consisting of divinylbenzene; diallyl phthalate; ethylene glycol dimethacrylate; 1,3-butylene glycol dimethacrylate; 1,6-hexanediol dimethacrylate; polyethylene glycol dimethacrylate; polypropylene glycol dimethacrylate; trivinylbenzene; divinylnaphthalene; diallyl maleate; diallyl fumarate; trimethylol propane trimethacrylate; and pentaerythritol tetraacrylate, and said prepolymer (2) being the addition polymerization product of

(i) about 5 mole percent to 100 mole percent of a cationic monomer selected from the group consisting of 2-vinylpyridinium chloride and 2-vinylpyridinium bromide, and

(ii) from about 95 mole percent to 0 mole percent of at least one monoethylenically unsaturated amide monomer,

the amount of prepolymer (2) employed in preparing the graft copolymer particles being from about 1 part to about 25 parts by weight for each 100 parts by weight of monomers (1) employed, said prepolymer prior to graft copolymerization being reacted with a compound that provides the prepolymer with cellulose reactive groups, said compound being an epihalohydrin.

4,456,725

COMPOSITIONS COMPRISING POLYCARBONATES, ACRYLATE RESINS, AND ALIPHATIC HYDROCARBONS

Ping Y. Liu, Naperville, Ill., and Niles R. Rosenquist, Evansville, Ind., assignors to General Electric Company, Mt. Vernon, Ind.

Filed Dec. 20, 1982, Ser. No. 451,406
Int. Cl.³ C08K 5/01; C08L 69/00
U.S. Cl. 524—476 11 Claims

1. A composition which consists essentially in admixture

a. a major amount of aromatic carbonate polymer;

b. a minor amount of a rubber-elastic graft copolymer acrylate resin having a glass transition temperature below about −20° C., which is sufficient to impact modify the aromatic carbonate polymer;

c. a minor amount of an aliphatic hydrocarbon of molecular weight less than about 1,000 which is sufficient to impact modify the composition of a and b at low temperatures, the quantity of a above about 90 weight percent of components a, b and c.

4,456,726

METHOD FOR MAKING AQUEOUS DISPERSIONS OF A SYNTHETIC RESIN

Werner Siol, Darmstadt; Herbert Fink, Bickenbach; Wolfgang Klesse, Mainz; Hubert Rauch, Weiterstadt, and Norbert Suetterlin, Ober-Ramstadt, all of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Oct. 18, 1982, Ser. No. 434,825
Claims priority, application Fed. Rep. of Germany, Nov. 27, 1981, 3147008
Int. Cl.³ C08F 2/16
U.S. Cl. 524—501 8 Claims

1. A method for making an aqueous, highly concentrated, bimodal, synthetic resin dispersion, which method comprises adding, to a first aqueous dispersion of particles of a first synthetic resin, a second aqueous dispersion of particles of a second synthetic resin and a monomer phase comprising at least one free radically polymerizable unsaturated monomer, at least one such monomer being sparingly soluble in water, and then polymerizing said monomer phase in the presence of an emulsifier and of a water soluble free radical forming initiator, the average size of said particles of said first synthetic resin differing by a factor between 2 and 15 from the average size of said particles of said second synthetic resin, the total weight of said first and second synthetic resin and of said monomer representing 100 parts by weight and the total weight of water present as the aqueous phase of said bimodal resin dispersion representing not more than 70 parts by weight.

4,456,727

PHENOL-FORMALDEHYDE RESINS AS ADDITIVES FOR SOLUTION-POLYMERIZED COPOLYMERS OF CONJUGATED ALKADIENES AND VINYL ARENES

Terence C. Middlebrook, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 30, 1982, Ser. No. 373,773
Int. Cl.³ C08L 61/10
U.S. Cl. 524—511 31 Claims

1. A process comprising mixing a solution-polymerized copolymer of a conjugated alkadiene and a vinyl arene with a minor amount of a heat curable phenol-formaldehyde resin having a melting point in the range of from about 50° C. to about 80° C., in an amount ranging from about 1.0 to about 5.0 parts by weight per hundred parts by weight of said copolymer.

4,456,728

GROUT RESTORATION

John Garuti, Sr.; John Garuti, Jr., both of Flushing, N.Y., and Karl Merkel, Bridgewater, N.J., assignors to Super-Tek Products, Inc., Woodside, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,728
Int. Cl.³ C08K 5/11; C09J 3/14
U.S. Cl. 524—522 13 Claims

1. In a latex coating composition comprising a pigment, a polymeric binder and water, the improvement which comprises incorporating therein about 2 to 20% by total weight of binder of a thermoplastic oligomer of an unsaturated ester having a molecular weight of about 1,000 to 20,000, and a Tg below about 0° C., the polymeric binder being thermoplastic and having a molecular weight of at least about 500,000, the composition being highly viscous, whereby the coating upon drying is adherent to a vitreous surface but is removable therefrom with alkali.

4,456,729

BINDERS FOR AQUEOUS STOVING LACQUERS BASED ON POLYESTERS AND A PROCESS FOR THE PRODUCTION THEREOF

Rolf Dhein, Krefeld; Lothar Bäcker, Dormagen, and Jochen Schoeps, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,731
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151366
Int. Cl.³ C08L 61/20, 67/02; C09D 3/50, 3/66
U.S. Cl. 524—542 8 Claims

1. Aqueous stoving lacquers based on:

(A) from 40 to 90 parts, by weight, of one or more polyesters having an acid number of from 1 to 100, a hydroxyl number of from 40 to 400 and an average molecular weight of from 1,500 to 10,000;

(B) from 10 to 60 parts, by weight, of one or more hydroxyl compounds having an average molecular weight of below 1,000; and

(C) from 10 to 40 parts, by weight, of one or more aminoplast resins;

wherein the hydroxyl component (B) is a reaction product of at least one dicarboxylic acid anhydride and at least one from 4- and 6-hydric alcohol, the reaction product containing from 1.0 to 1.3 moles of dicarboxylic acid radicals per polyol radical.

4,456,730

POLYMER MODIFIED POLYAMINES AND A PROCESS FOR THEIR PREPARATION

Gerhard Ballé, Leverkusen, and Werner Rasshofer, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 21, 1983, Ser. No. 506,262
Claims priority, application Fed. Rep. of Germany, Jun. 23, 1982, 3223396
Int. Cl.³ C08G 13/83
U.S. Cl. 524—839 14 Claims

1. A process for the production of a polymer modified polyamine having aromatically bound primary end groups by hydrolyzing in an aqueous alkaline medium a polymer modified isocyanate prepolymer having an isocyanate content of from 1 to 12.5 wt % and a polymer content of from 1 to 30 wt % which prepolymer is made from

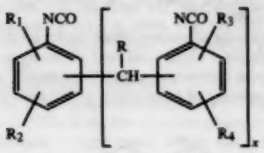
(a) a relatively high molecular weight polyhydroxyl compound,

(b) aromatic polyisocyanate, and optionally,

(c) chain lengthening or cross-linking agent and is polymer modified by in situ polymerization of the prepolymer or the isocyanate used to make the prepolymer with at least one unsaturated monomer in the presence of a radical forming polymerization catalyst to form a solution and/or

dispersion provided that the aromatic polyisocyanate (b) is

(i) 60 to 100 wt % polyisocyanate of the diphenyl alkane series corresponding to the formula



in which

R represents hydrogen, a straight-chained alkyl group having 1 to 7 carbon atoms or a branched alkyl group having 1 to 7 carbon atoms;

R_1, R_2, R_3, R_4 (which may be the same or different) each represents hydrogen or an alkyl group having up to 5 carbon atoms; and

x represents an integer of from 1 to 10; and

(ii) 0–40 wt % tolylene diisocyanate.

4,456,731

COMPOSITION FOR LINING THE WALLS OF REACTORS AND CONNECTED APPARATUS USED FOR POLYMERIZING VINYL COMPOUNDS WHICH PREVENTS OR REDUCES DEPOSITS AND INCRUSTATIONS ON SAID APPARATUS, AND THE METHOD FOR ITS USE

Adolfo Caporossi, Ravenna, and Leonello Del Signore, L'Aquila, both of Italy, assignors to Anic S.p.A., Palermo, Italy

Filed Mar. 1, 1982, Ser. No. 353,260

Claims priority, application Italy, Mar. 13, 1981, 20344 A/81

Int. Cl.³ C08F *116/06*

U.S. Cl. 525—61 **6 Claims**

1. A composition useful as a lining for the walls of reactors and other apparatus connected thereto, said lining capable of substantially preventing or reducing polymer deposition and the formation of incrustations on said walls during the polymerizations of vinyl compounds therein, said composition comprised of the tartaric acid ester of a polyvinyl alcohol having a saponification number between about 270 and about 400.

4,456,732

THERMOPLASTIC RESIN COMPOSITION HAVING IMPROVED WELD STRENGTH

Junji Nambu; Kenji Yoshino; Nagao Ariga; Kyotaro Shimazu, all of Chiba, and Hiroyuki Sato, Yachiyo, all of Japan, assignors to Dainippon Ink and Chemicals, Inc., Tokyo, Japan

Filed Jun. 10, 1983, Ser. No. 503,167

Claims priority, application Japan, Jun. 15, 1982, 57-101406

Int. Cl.³ C08L *69/00, 63/04*

U.S. Cl. 525—65 **8 Claims**

1. A thermoplastic resin composition having improved weld strength, said composition consisting essentially of

(A) 45 to 94.9% by weight of a polycarbonate resin,

(B) 5 to 40% by weight of a rubber-modified styrene-maleic anhydride copolymer resin, and

(C) 0.1 to 15% by weight of a bisphenol epoxy resin, a novolak epoxy resin, a phenoxy resin or a mixture thereof.

4,456,733

THERMOPLASTIC POLYBLEND COMPOSITIONS

Edwin D. Hornbaker, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 5, 1982, Ser. No. 365,702

Int. Cl.³ C08L *51/04, 55/02, 27/06*

U.S. Cl. 525—71 **11 Claims**

1. A thermoplastic polyblend composition comprising:

(A) a thermoplastic vinyl chloride polymer, and

(B) a rubber-modified thermoplastic compolymer of

(1) 95 to about 70% by weight of at least one vinyl aromatic monomer, and

(2) 5 to about 30% by weight of acrylic acid or methacrylic acid, or both, said copolymer grafted onto a substrate 1,4-polybutadiene rubber containing at least 90% by weight of cis-1,4-polybutadiene, said copolymer having been dried and substantially freed of residual volatile materials.

4,456,734

RUBBER POWDERS

Christian Lindner, Cologne, and Karl-Heinz Ott, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 4, 1982, Ser. No. 337,064

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1981, 3100748

The portion of the term of this patent subsequent to Dec. 20, 2000, has been disclaimed.

Int. Cl.³ C08F *265/06*

U.S. Cl. 525—310 **4 Claims**

1. A process for the production of a free-flowing rubber powder containing particles having an average diameter of from 0.01 to 10 mm, said process comprising completely breaking a latex of a rubber whose particles consist essentially of 99 to 80%, by weight, of an acrylate rubber having a glass transition temperature of below 0° C. and from 1 to 20%, by weight, of a polymer having a glass transition temperature above 0° C. so as to form an aqueous suspension of said rubber, then introducing into said aqueous suspension from 2 to 20% by weight, based on the rubber, of at least one vinyl monomer which forms a polymer having a glass transition temperature of about 25° C., and then polymerizing said vinyl monomer in the optional presence of a radical-forming catalyst.

4,456,735

CONTINUOUS PROCESS FOR THE PRODUCTION OF VINYL CHLORIDE POLYMERS IN AQUEOUS SUSPENSION

Manfred Engelmann, Burghausen; Heinz Klippert, and Eberhard Tzschoppe, both of Burgkirchen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 9, 1982, Ser. No. 406,219

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 3132421

Int. Cl.³ C08F *14/06, 2/20*

U.S. Cl. 525—317 **12 Claims**

1. A continuous process for the production of a vinyl chloride polymer by homopolymerization, or copolymerization in the presence of at least one monomer which can be copolymerized with vinyl chloride, or graft polymerization of vinyl chloride in the presence of at least one polymer which can be graft polymerized with vinyl chloride in aqueous suspension in the presence of at least one activator which decompose to form free radicals and of at least one suspending agent in at least two zones, the mixture being cooled, released from pressure and freed from unreacted monomers after leaving the last zone and, after the removal of the bulk of the aqueous liquid, being processed to give a dry polymer powder, which comprises agitating the polymerization mixture in the first zone at a volume-specific stirrer power of 0.6 to 6 kWm^{-3} until a vinyl chloride monomer conversion of 0 to 3 percent by weight has

been reached, in an apparatus, at a number of theoretical cascade stages of 3 to 20 and at average dwell times of the polymerization mixture of 5 to 60 minutes and agitating the polymerization mixture in the second zone at a volume-specific stirrer power of 0.01 to 0.6 kWm^{-3} in an apparatus, at a number of theoretical cascade stages of 10 to 100 and carrying out polymerization at temperatures of 40° to 80° C. until a conversion of 70 to 98% by weight has been reached.

4,456,736

METHOD OF MANUFACTURING GRAFT COPOLYMERS COMPRISING POLYPHENYLENE ETHER

Shunitsu Miyashita; Masaaki Azuma, both of Kobe, and Akiyoshi Somemiya, Akashi, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 181,110, Aug. 25, 1980, abandoned. This application Dec. 30, 1981, Ser. No. 335,684
Claims priority, application Japan, Aug. 30, 1979, 54-111177
Int. Cl.³ C08F *233/08*
U.S. Cl. 525—392 **17 Claims**

1. A metho of producing a graft copolymer from solid phase polyphenylene ether and gaseous phase radical polymerizable compound, comprising the steps of

dissolving a radical polymerization initiator in an acetone solvent;

adding said solvent having said initiator dissolved therein to said solid phase polyphenylene ether;

removing said solvent from the resulting mixture of said initiator, solvent and polyphenylene ether;

placing the resulting polyphenylene ether and initiator, wherein said initiator was absorbed in said polyphenylene ether, into a reactor;

adjusting said reactor to a polymerization temperature;

providing said gaseous phase radical polymerizable compound with said polymerization temperature;

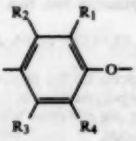
introducing said gaseous phase radical polymerizable compound at said polymerization temperature to said reactor;

whereby said radical polymerizable compound in gaseous phase is graft polymerized with said solid phase polyphenylene ether; and

wherein said radical polymerizable compound has a vapour pressure of not less than 50 mm Hg;

wherein said polyphenylene ether is in the form of powder, beads or pellets; and

wherein said polyphenylene ether has repeating units with the following formula:



wherein R_1, R_2, R_3 and R_4 are monovalent substituent selected from the group consisting of hydrogen, halogen, hydrocarbon radical, substituted hydrocarbon group, hydrocarbonoxy radical, substituted hydrocarbonoxy radical, amino radical and substituted amino group;

and wherein said radical polymerizable compound is used in an amount of 5 to 95 weight parts, said initiator is used in an amount of 0.2 to 30 weight parts, based on 100 weight parts of said copolymer.

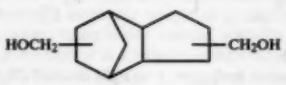
4,456,737

HIGH SOLIDS COATING COMPOSITION BASED ON BISHYDROXYMETHYL TRICYCLO POLYOLS

Edward DiDomenico, Jr., Anoka, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

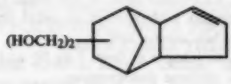
Filed Apr. 12, 1983, Ser. No. 484,246
Int. Cl.³ C08L *61/28*; C08G *12/32*
U.S. Cl. 525—398 **7 Claims**

1. A composition of matter which is the product of at least one methylolamino compound and at least one bishydroxymethyl tricyclo compound which is a member selected from the group consisting of compounds of the formula:



(I)

and



(II)

and mixtures thereof.

4,456,738

COATING COMPOSITION COMPRISING CHAIN-EXTENDABLE CROSSLINKABLE POLYOL AND DIBLOCKED DIISOCYANATE DIURETHANE OLIGOMER

Joseph W. Holubka, Livonia, and Ray A. Dickie, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 334,797, Dec. 28, 1981, Pat. No. 4,410,679. This application Jan. 5, 1983, Ser. No. 455,700
Int. Cl.³ C08L *76/04*; C08G *18/80*
U.S. Cl. 525—454 **11 Claims**

1. A resin composition comprising:

chain-extendable, crosslinking polyol of molecular weight about 200 to about 1000, having at least three hydroxyl groups, selected from polyhydroxy functional straight or branched chain saturated or unsaturated hydrocarbons, optionally comprising one or more oxy or ester moieties and optionally comprising one or more heterocyclic atoms, aromatic and/or heterocyclic rings, the heterocyclic atom(s) being from N, O and S, wherein said crosslinking agent comprises an aminoplast crosslinking agent;

chain-extendable, diblocked diisocyanate diurethane oligomer reaction product of diol with a half-blocked diisocyanate in molar ratio of about 1:2, respectively, said oligomer being of molecular weight about 300 to about 1500, the blocking group of which oligomer has a de-blocking temperature of about 100° C. to about 190° C.; and

crosslinking agent reactive with the hydroxy functionality of said polyol and substantially unreactive with de-blocked isocyanate functionality of said diblocked diisocyanate diurethane oligomer, wherein said crosslinking agent and said polyol are present in a molar equivalent ratio of about 1:1 to about 1:15, respectively.

4,456,739

COATING COMPOSITION COMPRISING CHAIN-EXTENDABLE CROSSLINKABLE POLYOL AND DIBLOCKED DIISOCYANATE DIUREA OLIGOMER

Joseph W. Holubka, Livonia, and Ray A. Dickie, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 334,796, Dec. 28, 1981, Pat. No. 4,410,678. This application May 4, 1984, Ser. No. 491,468

Int. Cl.³ C08G *18/32, 18/80;* C08L *63/00, 61/28*

U.S. Cl. 525—510 19 Claims

1. A resin composition comprising:

chain-extendable, crosslinkable polyol of molecular weight about 200 to 1000, being the reaction product of a diepoxide of molecular weight about 100 to about 1000, with a diol of molecular weight about 60 to 500, said polyol having at least three hydroxyl groups, selected from polyhydroxy functional straight or branched chain saturated or unsaturated hydrocarbons, optionally comprising one or more oxy or ester moieties and optionally comprising one or more heterocyclic atoms, aromatic and/or heterocyclic rings, the heterocyclic atom(s) being selected from N, O and S;

chain-extendable, diblocked diisocyanate diurea oligomer of molecular weight about 300 to 1500, comprising the reaction product of a half-blocked diisocyanate with diamine in molar ratio of about 2:1, respectively, the blocking group of which oligomer has a de-blocking temperature of about 100° C. to about 190° C.; and

crosslinking agent reactive with the hydroxy functionality of said polyol and substantially unreactive with de-blocked isocyanate functionality of said diblocked diisocyanate diurea oligomer, wherein said crosslinking agent and said polyol are present in a molar equivalent ratio of about 1:1 to about 1:15, respectively.

4,456,740

COATING COMPOSITION COMPRISING CHAIN-EXTENDABLE CROSSLINKABLE POLYOL AND DIBLOCKED DIISOCYANATE DIURETHANE OLIGOMER

Joseph W. Holubka, Livonia, and Ray A. Dickie, Birmingham, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 334,797, Dec. 28, 1981, Pat. No. 4,410,679. This application Jan. 5, 1983, Ser. No. 455,698

Int. Cl.³ C08L *63/00, 75/04;* C08G *18/80*

U.S. Cl. 525—528 9 Claims

1. A resin composition comprising:

chain-extendable, crosslinking polyol of molecular weight about 200 to about 1000, having at least three hydroxyl groups, selected from polyhydroxy functional straight or branched chain saturated or unsaturated hydrocarbons, optionally comprising one or more oxy or ester moieties and optionally comprising one or more heterocyclic atoms, aromatic and/or heterocyclic rings, the heterocyclic atom(s) being selected from N, O and S, wherein said chain-extendable crosslinkable polyol is the reaction product of a diepoxide of molecular weight about 100 to 1000 with a diol of molecular weight about 60 to 500;

chain-extendable, diblocked diisocyanate diurethane oligomer reaction product of diol with a half-blocked diisocyanate in molar ration of about 1:2, respectively, said oligomer being of molecular weight about 300 to about 1500, the blocking group of which oligomer has a de-blocking temperature of about 100° C. to about 190° C.; and

crosslinking agent reactive with the hydroxy functionality of said polyol and substantially unreactive with de-blocked isocyanate functionality of said diblocked diisocyanate diurethane oligomer, wherein said crosslinking agent and said polyol are present in a molar equivalent ratio of about 1:1 to about 1:15, respectively.

4,456,741

TERPOLYMER COMPOSITIONS USEFUL AS PRESSURE-SENSITIVE ADHESIVES

William A. Ames, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,493

Int. Cl.³ C08F *212/08*

U.S. Cl. 526—264 8 Claims

1. A polymerized terpolymeric composition comprising about 80 to 60 weight percent n-butyl acrylate, about 25 to 15 weight percent N-vinyl-2-pyrrolidinone, and about 15 to 5 weight percent styrene and having a melt viscosity of about 15,000 to 200,000 which is useful as a pressure-sensitive adhesive.

4,456,742

POLYURETHANE COATING COMPOSITION WITH A CURATIVE CONTAINING POLYHYDROXYALKYLPHOSPHINE OXIDE

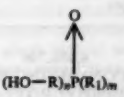
Fui-Tseng H. Lee, Princeton, and Joseph Green, East Brunswick, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 17, 1983, Ser. No. 476,162

Int. Cl.³ C08G *18/80*

U.S. Cl. 528—45 10 Claims

1. A heat curable polyurethane coating composition comprising a blocked urethane NCO prepolymer and a hydroxy curative at least part of which is a polyhydroxyalkylphosphine oxide of the formula:



wherein R is alkylene of 3 to 6 carbon atoms, R_1 is an alkyl of 2 to 10 carbon atoms, cycloalkyl of 6 to 12 carbon atoms, n is an integer of 2 or 3 it being understood that when n is 2, m is 1 and when n is 3, m is 0.

4,456,743

POLYURETHANE ADHESIVE COMPOSITION AND A CURATIVE SYSTEM CONTAINING A POLYHYDROXYALKYLPHOSPHINE OXIDE

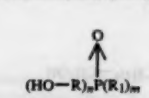
Fui-Tseng H. Lee, Princeton, and Joseph Green, East Brunswick, both of N.J., assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 17, 1983, Ser. No. 476,001

Int. Cl.³ C08G *18/38*

U.S. Cl. 528—60 6 Claims

1. In a polyurethane composition for producing an adhesive when cured, said composition comprising an NCO terminated urethane prepolymer from a polyol selected from the class consisting of polyhydroxy functional polyethers and polyesters and a polyhydroxy aliphatic curative system, the improvement of incorporating in the curative system from about 10% to about 60% based on the weight of the curative system of a polyhydroxyalkylphosphine oxide of the formula:



wherein R is alkylene of 3 to 6 carbon atoms, R_1 is alkyl of 2 to 10 carbon atoms, cycloalkyl of 6 to 12 carbon atoms and n is an integer of 2 to 3, it being understood that when n is 2, m is 1 and when n is 3, m is 0.

4,456,744

COMPOSITION FOR PRODUCING POLYURETHANE RESIN AT AMBIENT TEMPERATURE

Yoshio Kamatani, Osaka; Michio Tanaka, Shizuoka; Kyuya Yamazaki, and Kenichi Nishino, both of Osaka, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Nov. 29, 1982, Ser. No. 445,098
Claims priority, application Japan, Dec. 23, 1981, 56-208434
Int. Cl.³ C08G 18/78
U.S. Cl. 528—71 10 Claims

1. A composition for polyurethane resins which comprises an isocyanate component having an oxadiazinetrione ring and a polyol component having, in the molecule, at least one group selected from the group consisting of a tertiary amino group, a quaternary ammonium group and a salt-formed carboxyl group.

4,456,745

POLYURETHANES PREPARED FROM POLYCARBONATES

Sundar J. Rajan, Woodbury, Minn., assignor to Ethyl Corporation, Richmond, Va.

Division of Ser. No. 381,207, May 24, 1982, Pat. No. 4,423,205. This application Jul. 11, 1983, Ser. No. 512,347
Int. Cl.³ C08G 18/42
U.S. Cl. 528—85 18 Claims

3. A polyurethane which is the reaction product of:
(a) a polycarbonate glycol formed by heating a cyclic carbonate in the presence of a cationic initiator;
(b) an organic polyisocyanate; and
(c) an organic chain extender having at least two isocyanate-reactive hydrogens.

4,456,746

POLYESTER CONTAINING RESIDUES OF A 1-HYDROXY-3-6-BIS(HYDROXY-ALKOXY)XANTH-9-ONE, PROCESS FOR PREPARING SAME AND SHAPED ARTICLES THEREOF

Patrick J. Horner, Wiltshire, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Sep. 27, 1982, Ser. No. 424,294
Claims priority, application United Kingdom, Oct. 2, 1981, 8129808; Oct. 21, 1981, 8131765
Int. Cl.³ C08G 63/18, 63/66
U.S. Cl. 528—128 14 Claims

1. A linear polyester which contains in its molecule esterification residues of a 1-hydroxy-3,6-bis(hydroxyalkoxy)xanth-9-one the amount of said residues being 0.01 to 30% by weight based on the total polymer.

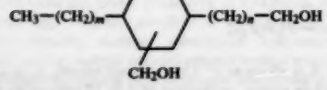
4,456,747

HIGH SOLIDS COATING COMPOSITIONS BASED ON CYCLOALIPHATIC DIOLS

Edward DiDomenico, Jr., Anoka, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Apr. 12, 1983, Ser. No. 484,247
Int. Cl.³ C08G 12/32; C08L 61/28
U.S. Cl. 528—254 6 Claims

1. A composition of matter which is the product of at least one methylolamino compound and at least one cycloaliphatic diol of the formula:



where m is an integer from 3 to 6 and n is an integer from 6 to 9 and the sum of m plus n is 12.

4,456,748

HYBRID HUMAN LEUKOCYTE INTERFERONS

David V. Goeddel, Burlingame, Calif., assignor to Genentech, Inc., South San Francisco, Calif.

Continuation-in-part of Ser. No. 237,388, Feb. 23, 1981, Pat. No. 4,414,150, and Ser. No. 205,579, Nov. 10, 1980, abandoned. This application Sep. 25, 1981, Ser. No. 305,657
Int. Cl.³ C12N 15/00, 1/20, 1/00; C07H 21/04; C12P 21/00, 21/02, 19/34
U.S. Cl. 536—27 5 Claims

1. Double stranded DNA comprising a strand encoding a polypeptide of approximately 165–166 amino acids, the amino acid sequence of said polypeptide comprising, in sequence, discrete sub-sequences corresponding in amino acid identity and number to sub-sequences of different, naturally, occurring leukocyte interferons, the amino acid sequence of said polypeptide differing in overall sequence from the amino acid sequence of naturally occurring leukocyte interferons.

4,456,749

PROCEDURE FOR PRECIPITATING CELLULOSE DERIVATIVE

Leo Mandell; Vidar Eklund; Kurt Ekman; Jouko Huttunen, and Olli Turunen, all of Porvoo, Finland, assignors to Neste Oy, Finland

PCT No. PCT/FI82/00070, 371 Date Aug. 30, 1983, 102(e) Date Aug. 30, 1983, PCT Pub. No. WO83/02279, PCT Pub. Date Jul. 7, 1983
PCT Filed Dec. 30, 1982, Ser. No. 537,370
Claims priority, application Finland, Dec. 30, 1981, 814209
Int. Cl.³ C08B 15/06, 3/28, 11/22
U.S. Cl. 536—30 4 Claims

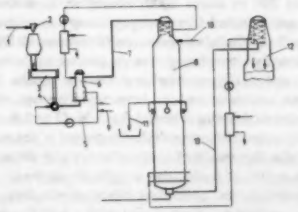
1. Procedure for precipitating cellulose carbamate from an aqueous alkali solution, characterized in that the solution is brought into contact with an aqueous solution of sulphuric acid containing one or several cations selected from the group consisting of Na, Al, Mg, Zn and Ca cations.

4,456,750

METHOD FOR CONTROLLING THE ALKALINITY OF FEED CIRCULATION WHEN PREHYDROLYZING WOOD CHIPS

Tapani Marttala, and Kari Saramäki, both of Varkaus, Finland, assignors to A.Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Feb. 2, 1983, Ser. No. 463,068
Claims priority, application Finland, Feb. 11, 1982, 820456
Int. Cl.³ D21C 3/06, 3/26, 1/04
U.S. Cl. 536—59 7 Claims



1. A method of prehydrolysis of wood chips, wherein the wood chips are first subjected to the action of steam in a steaming vessel, the prehydrolysis agent is an acid stronger than sulfurous acid, a first liquid circulation system transfers the chips from the steaming vessel to a heat exchanger by means of high pressuretransfer valve, a second liquid circulation system transfers the chips from said heat exchanger to the prehydrolysis vessel, excess liquid is recirculated to the heat exchanger and then to the transfer valve and a liquid containing ammo-

nium sulfite or an alkaline sulfite is added to the first liquid circulation system in an amount to give a pH at least neutral.

4,456,751

MULTIPLE STAGE PROCESS FOR PREPARING MIXED HYDROXYALKYLCELLULOSE ETHERS

Christopher D. Messelt, and Glenda P. Townsend, both of Baton Rouge, La., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 22, 1983, Ser. No. 534,951
Int. Cl.³ C08B 11/193
U.S. Cl. 536—91 9 Claims

1. A process for preparing mixed hydroxyalkyl cellulose ethers comprising sequentially reacting an alkali cellulose with (a) an alkylene oxide under conditions sufficient to attach to the cellulose a portion of the amount of hydroxyalkyl groups to be attached thereto, (b) an etherifying agent which is different from the alkylene oxide employed in steps (a) and (c) and which reduces the formation of poly(alkylene oxide) chains, under conditions such that ether groups are attached to the cellulose, and (c) an alkylene oxide under conditions sufficient to attach to the cellulose a second portion of the amount of hydroxyalkyl groups to be attached thereto.

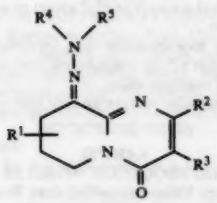
4,456,752

PROCESS FOR THE PREPARATION OF 9-HYDRAZONO-6,7,8,9-TETRAHYDRO-4H-PYRO[1,2-A]PYRIMIDINE-4-ONE COMPOUNDS, THE SALTS AND HYDRATES THEREOF

István Hermecz; Tibor Breining; Lelle Vasvári neé Debreczy; Ágnes Hörváth, all of Budapest, and József Kökösi, Budaörs, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T., Budapest, Hungary

Continuation of Ser. No. 148,240, May 9, 1980, abandoned. This application Dec. 4, 1981, Ser. No. 327,689
Claims priority, application Hungary, May 11, 1979, CI 1934
Int. Cl.³ C07D 471/04
U.S. Cl. 544—116 3 Claims

1. A process for the preparation of a nitrogen bridgehead compound of the formula (I)



wherein

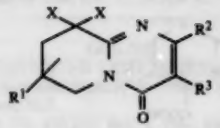
R^1 is hydrogen, lower alkyl, styryl, or lower alkoxycarbonyl;

R^2 is hydrogen or lower alkyl;

R^3 is carboxy, lower alkoxycarbonyl, carbamoyl, cyano, formyl, or lower alkyl;

R^4 is hydrogen, lower alkyl, hydroxyethyl, carboxy-lower alkyl, phenyl, naphthyl, phenyl or naphthyl substituted by at least one hydroxy, halogen, lower alkyl, sulfo, carboxy, lower alkoxy, methylenedioxy, amino, nitro or trifluoromethoxy, methoxycarbonyl ethoxycarbonyl, trifluoromethyl, benzyl, 2-, 3- or 4-pyridyl, or benzothiazol-2-yl;

R^5 is hydrogen, lower alkanoyl, benzoyl or nicotinoyl or the group $—NR^4R^5$ is piperidinyl, pyrrolidinyl or morpholinyl, or a pharmaceutically acceptable salt, hydrate, stereoisomer, optically active isomer, geometric isomer or tautomer thereof, which comprises reacting a racemic or optically active compound of the formula (II)



wherein X is halogen, with a compound of the formula (III)

or a pharmaceutically acceptable acid addition salt thereof, at a temperature of 0° to 200° C.

4,456,753

PROCESS FOR THE MANUFACTURE OF HIGHLY CRYSTALLINE SODIUM CEFOPERAZONE

Daniel J. O'Brien, Jr., Canterbury, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Feb. 7, 1983, Ser. No. 464,223
Int. Cl.³ C07D 501/12
U.S. Cl. 544—20 4 Claims

1. A process for preparing highly crystalline sodium cefoperazone which comprises the steps of (a) combining a water-/acetone/sodium cefoperazone solution (1–1.5, 2.0–5.0, 1.0; v, v, w) with sufficient acetone to provide a water/acetone solution containing from about 14% to about 17% (v/v) water based or acetone level at a temperature of about 5°–25° C., (b) adding sufficient acetone to the resulting slurry to provide a water/acetone solution containing from about 3% to 5% water based on acetone level; (c) and separating the resulting crystalline sodium cefoperazone from said slurry.

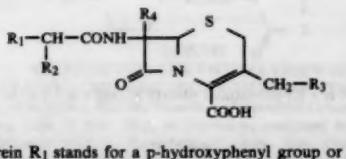
4,456,754

PROCESS FOR THE PREPARATION OF CEPHALOSPORIN DERIVATIVES USING THIOESTERS

Masahiro Murakami; Masateru Kobayashi; Kimiyo Yamamoto, all of Nobeoka, and Chisei Shibuya, Fuji, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Tokyo, Japan

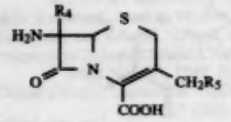
Division of Ser. No. 298,884, Sep. 2, 1981. This application Sep. 3, 1982, Ser. No. 414,946
Claims priority, application Japan, Sep. 2, 1980, 55-120619; Sep. 4, 1980, 55-121718; Oct. 13, 1980, 55-142048; Oct. 22, 1980, 55-146859; Oct. 24, 1980, 55-148178; Jul. 14, 1981, 56-108797
Int. Cl.³ C07D 501/06
U.S. Cl. 544—21 9 Claims

1. A process for the preparation of cephalosporin derivatives represented by the following general formula (V) or pharmacologically acceptable salts thereof:



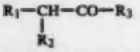
(V)

wherein R_1 stands for a p-hydroxyphenyl group or a cyanomethylthio group, R_2 stands for a hydrogen atom or an amino or protected amino group, R_3 stands for a 1H-1,2,3-triazol-5-ylthio group or a 1-methyl-1,2,3,4-tetrazol-5-ylthio group, and R_4 stands for a hydrogen atom or a methoxy group, which comprises reacting a 7-aminocephalosporin derivative represented by the following general formula (IV) or a salt thereof:



(IV)

wherein R_4 is as defined above and R_5 stands for a halogen atom, an azido group, an acetoxy group or a benzimidazolylthio group, with a thioester compound represented by the following general formula (I):



(I)

wherein R_1, R_2 and R_3 are as defined above, in the presence of a solvent.

4,456,755

7-OXYGEN ANALOGS OF CEPHALOSPORINS

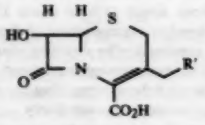
John C. Sheehan, Lexington, and Young S. Lo, Boston, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Aug. 5, 1974, Ser. No. 494,507

Int. Cl.³ C07D *501/00*; A61K *31/545*

U.S. Cl. 544—23 **39 Claims**

1. A compound having the formula:



where R' is an organic nucleophile.

4,456,756

SPIROTHIAZOLIDINYL PIPERAZINE DERIVATIVES

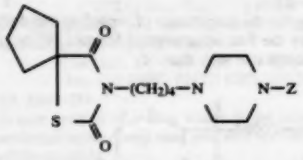
Davis L. Temple, Jr., and Richard E. Yeager, both of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Aug. 3, 1981, Ser. No. 289,351

Int. Cl.³ C07D *417/06*

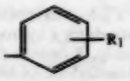
U.S. Cl. 544—364 **5 Claims**

1. A spirothiazolidinedione of Formula I

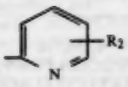


(I)

wherein Z is a R_1-substituted phenyl having the formula



in which R_1 is hydrogen, halogen, lower alkyl of 1 to 4 carbon atoms, lower alkoxy of 1 to 4 carbon atoms or trifluoromethyl, a R_2-substituted 2-pyridinyl radical having the formula



in which R_2 is hydrogen or cyano, or a pharmaceutically acceptable nontoxic acid addition salt thereof.

4,456,757

ISOQUINOLINESULFONYL DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Hiroyoshi Hidaka, 799-25, Kannonji-cho, Tsu-shi, Mie-ken; Takanori Sone, Nobeoka; Yasuharu Sasaki, Nobeoka, and Taisuke Sugihara, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka and Hiroyoshi Hidaka, Tsu, both of, Japan

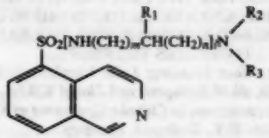
Filed Mar. 12, 1982, Ser. No. 357,770

Claims priority, application Japan, Mar. 20, 1981, 56-39550; Jun. 1, 1981, 56-82559; Jan. 12, 1982, 57-2229; Jan. 14, 1982, 57-3291

Int. Cl.³ C07D *217/02, 401/12, 413/12*; A61K *31/47*

U.S. Cl. 546—139 **9 Claims**

1. A compound of Formula (I):



(I)

wherein

l is zero or one;

m and n each is zero or an integer of one to nine;

m+n is an integer of at least one;

R_1 is a hydrogen atom, a C_{1-10} alkyl group, a C_{5-6} cycloalkyl group or a phenyl group;

R_2 and R_3 each is a hydrogen atom, a C_{1-10} alkyl group, a C_{5-6} cycloalkyl group, a phenyl group or a C_{7-10} phenylalkyl group; or

R_2 and R_3 are independently C_{1-6} alkylene groups linked directly to form a 5- to 7-membered heterocyclic ring with the adjacent nitrogen atom;

or the pharmaceutically acceptable acid addition salt thereof.

4,456,758

HETEROCYCLIC NITRILES

Jean-Claude Aloup, Villeneuve-le-Roi; Jean Bouchaudon, Morsang-sur-Orge; Daniel Farge, Thiais, and Claude James, Paris, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

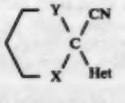
Filed Aug. 10, 1982, Ser. No. 406,998

Claims priority, application France, Aug. 11, 1981, 81 15527

Int. Cl.³ C07D *409/04, 407/04*

U.S. Cl. 546—284 **4 Claims**

1. A heterocyclic nitrile of the formula:



(I)

wherein

(i) Het represents a heterocyclic radical of aromatic character containing one or two nitrogen atoms selected from pyrid-3-yl, pyrid-4-yl, pyridazinyl, pyrazinyl, pyrimidinyl, quinolyl, imidazolyl, naphthyridinyl, quinoxalinyl and

quinazolinyl, X represents oxygen and Y represents a valency bond or a methylene radical, or alternatively X represents sulphur and Y represents sulphur, a valency bond or a methylene radical, or

(ii) Het represents the pyrid-2-yl radical, X represents oxygen and Y represents a valency bond or a methylene radical, or alternatively X represents sulphur and Y represents sulphur or a methylene radical.

4,456,759

5-BENZOYL-7-HALO-1,2-DIHYDRO-3H-PYRROLO-[1,2-A]PYRROLE-1,1-DICARBOXYLIC ACIDS AND ESTERS THEREOF

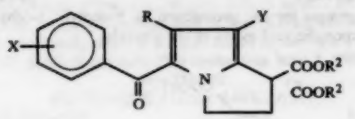
Joseph M. Muchowski, Sunnyvale, Calif., and Robert Greenhouse, Mexico City, Mexico, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 198,551, Oct. 20, 1980. This application Jun. 11, 1982, Ser. No. 387,562

Int. Cl.³ C07D *487/02*

U.S. Cl. 548—453 **1 Claim**

1. A compound of the formula



(V)

wherein

R is hydrogen or lower alkyl of one to six carbon atoms;

X is hydrogen, lower alkyl of one to six carbon atoms, lower alkoxyl of one to six carbon atoms, lower alkoxycarbonyl in which the alkoxy group has one to six carbon atoms, carboxyl, lower alkylcarbonyl in which the alkyl group has one to six carbon atoms, sulfonic acid, sulfonic acid alkyl ester in which the alkyl group has one to six carbon atoms, fluoro, chloro or bromo;

Y is chloro or bromo, and each R^2 is independently hydrogen or lower alkyl of one to six carbon atoms.

4,456,760

PROCESS FOR THE PREPARATION OF INDOLES

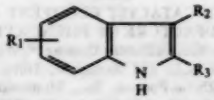
Fujio Matsuda, Kanagawa; Takazo Kato, Ohimachi, and Tadamitsu Kiyoura, Kanagawa, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Continuation-in-part of Ser. No. 254,457, Apr. 15, 1981, abandoned. This application May 5, 1982, Ser. No. 374,919

Int. Cl.³ C07D *209/08*

U.S. Cl. 548—508 **9 Claims**

1. A process for the preparation of indoles of the formula



wherein, R_1 is a hydrogen atom, chlorine atom, bromine atom, methyl group, or methoxy group and R_2 and R_3 are a hydrogen atom, methyl group or ethyl group, at least one R_2 and R_3 being hydrogen; which comprises the step of reacting a compound selected from the group consisting of aniline, o-toluidine, m-toluidine, p-toluidine, o-chloroaniline, o-bromoaniline, m-chloroaniline, m-bromoaniline, p-chloroaniline, p-bromoaniline, o-anisidine, m-anisidine and p-anisidine, with a member selected from the group consisting of ethylene glycol, 1,2-propylene glycol, and 1,2-butanediol, in the presence of a catalytic amount of metallic copper or copper oxide or both, in an atmosphere of hydrogen or a mixture of hydrogen with nitrogen, hydrogen with carbon dioxide, or hydrogen with nitrogen and carbon dioxide, in the liquid phase at a temperature in the range of from 200° C. to 500° C.

4,456,761

4-SUBSTITUTED DEHYDROPROLINES

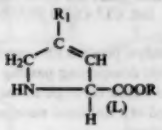
John Krapcho, Somerset, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 230,206, Feb. 2, 1981, Pat. No. 4,356,182, which is a division of Ser. No. 86,905, Oct. 22, 1979, Pat. No. 4,291,040. This application Jul. 29, 1982, Ser. No. 403,251

Int. Cl.³ C07C *207/24*

U.S. Cl. 548—532 **3 Claims**

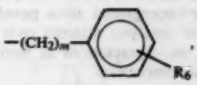
1. A compound of the formula



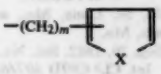
wherein

R is hydrogen or lower alkyl of 1 to 7 carbons;

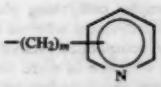
R_1 is lower alkenyl of 2 to 7 carbons, lower alkynyl of 2 to 7 carbons,



—$(CH_2)_m$-cycloalkyl wherein said cycloalkyl ring is of 3 to 7 carbons, α-naphthyl, β-naphthyl,



wherein said —$(CH_2)_m$-bridge is attached to an available carbon atom, or



wherein said —$(CH_2)_m$—bridge is attached to an available carbon atom;

R_6 is hydrogen, lower alkyl of 1 to 4 carbons, lower alkoxy of 1 to 4 carbons, lower alkylthio of 1 to 4 carbons, chloro, fluoro, bromo, trifluoromethyl, or hydroxy;

m is zero, one, two or three; and

X is O or S.

4,456,762

PROCESS FOR THE PREPARATION OF 4,7-DICHLORO-3-HYDROXY-THIONAPHTHENE

Ernst Spietschka, Idstein/Taunus, and Manfred Urban, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jun. 1, 1982, Ser. No. 383,731

Claims priority, application Fed. Rep. of Germany, Jun. 3, 1981, 3121980

Int. Cl.³ C07D *333/52*

U.S. Cl. 549—56 **6 Claims**

1. A process for the preparation of 4,7-dichloro-3-hydroxy-

thionaphthene which comprises cyclizing 2,5-dichloro-phenylthioglycolic acid chloride at a temperature of from −20° to +40° C. in dichloromethane in the presence of a Freidel-Crafts catalyst.

4,456,763

PREPARATION OF NAPHTHALENE-OXIDATION CATALYST BY IMPREGNATION OF SILICA WITH AQUEOUS SOLUTION OF VOC_2O_4-K_2SO_4-$KHSO_4$

Philip H. Harju, Spring Church, and Eugene A. Pasek, Export, both of Pa., assignors to Koppers Company, Inc., Pittsburgh, Pa.

Division of Ser. No. 303,169, Sep. 17, 1981, Pat. No. 4,389,336. This application Mar. 25, 1983, Ser. No. 478,739

Int. Cl.³ C07D *307/89*

U.S. Cl. 549—249 **6 Claims**

1. A fluid-bed catalyst process for conversion of naphthalene to phthalic anhydride comprising passing a gaseous mixture of air and naphthalene vapor through a reaction zone containing a catalyst maintained in a fluidized state, said catalyst provided by a process comprising:

adding an aqueous solution of salts, comprising vanadyl oxalate, potassium sulfate and potassium bisulfate, to porous silica support to form a substantially free-flowing dry-appearing salt-impregnated silica powder, the powder characterized in in having substantially all of said salts contained within pores of the silica powder;

whereby the salt-impregnated silica powder after calcining yields particles of catalytic material over a range of sizes, which particles are characterized in having a substantially uniform chemical composition.

4,456,764

PROCESS FOR THE MANUFACTURE OF MALEIC ANHYDRIDE

James T. Wrobleski, St. Louis, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Sep. 20, 1982, Ser. No. 420,452

Int. Cl.³ C07D *307/60*

U.S. Cl. 549—260 **11 Claims**

1. In a process for preparing maleic anhydride, wherein a mixture of an oxygen-containing gas and a saturated hydrocarbon having 4 to 10 carbon atoms in vapor phase is contacted with a catalyst complex comprising phosphorus, vanadium, and oxygen, the improvement wherein the complex also includes an integrally incorporated catalyst modifier comprising titanium combined with one or more elements selected from the group consisting of aluminum, cerium, cobalt and iron in an amount sufficient to substantially increase activity of the catalyst the said catalyst complex consisting essentially of phosphorus at a phosphorus-to-vanadium atom ratio of about 1:2 to about 2:1, vanadium, oxygen and the modifier.

4,456,765

TRICHOTHEC-9-ENE-3,4,15-TRIOL,12,13-EPOXY-3-CHLOROACETATE USEFUL AS AN ANTI-TUMOR AGENT

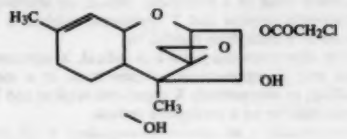
Henry Schmitz, Syracuse; Takushi Kaneko, Fayetteville; John M. Essery, Pleasantville, and Terrence W. Doyle, Fayetteville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 339,581, Jan. 15, 1982, Pat. No. 4,413,134, which is a division of Ser. No. 240,340, Mar. 4, 1981, Pat. No. 4,332,732, which is a division of Ser. No. 137,336, Apr. 4, 1980, Pat. No. 4,284,568. This application Jun. 20, 1983, Ser. No. 506,133

Int. Cl.³ C07D *311/78*

U.S. Cl. 549—332 **1 Claim**

1. The compound having the formula



4,456,766

PROCESS FOR THE PRODUCTION OF N-ACETYL-2,3-DEHYDRO-AMINOCARBOXYLIC ACID ESTERS

Franz Effenberger, and Thomas Beisswenger, both of Stuttgart, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

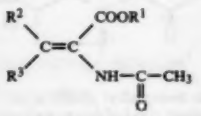
Filed Sep. 16, 1982, Ser. No. 418,843

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1981, 3140227

Int. Cl.³ C07C *102/04, 103/127, 149/23, 149/31*

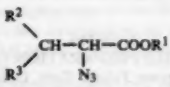
U.S. Cl. 560—17 **20 Claims**

1. A process for the production of N-acetyl-2,3-dehydro-aminocarboxylic acid esters of the formula:



(I)

in which R^1 is a methyl or ethyl group, R^2 is hydrogen, or a methyl group and R^3 is hydrogen, an alkyl group having 1 to 6 carbon atoms, a phenyl group, an unsubstituted alkylmercapto group having 1 to 6 carbon atoms, a methoxycarbonylmethylmercapto group or a phenylmercapto group, comprising reacting a 2-azidocarboxylic acid ester of the formula:



(II)

in the presence of rhenium VII sulfide, rhenium oxide, or a mixture of rhenium VII sulfide and rhenium VII oxide and at a temperature between 50° and 150° C. with a mixture of one part by volume of acetic anhydride and 1.5 to 5 parts by volume of acetic acid.

4,456,767

SOLVENT AND CATALYST RECOVERY AND RECYCLE IN THE MANUFACTURE OF PHENOXYBENZOIC ACID

Thomas J. Giacobbe, Skillman; Thomas N. Williams, Jr., Plainfield, both of N.J., and James M. Horn, Richmond, Va., assignors to Rhone-Poulenc, Inc., Monmouth Jct., N.J.

Continuation of Ser. No. 286,942, Jul. 27, 1981, abandoned. This application Aug. 2, 1983, Ser. No. 518,975

Int. Cl.³ C07C *51/16*

U.S. Cl. 562—414 **13 Claims**

1. A process for recovering and recycling solvent and catalyst in the oxidation of a 3-(substituted phenoxy) toluene feed to the corresponding 3-(substituted phenoxy) benzoic acid employing a combination of a cobalt compound and a bromide compound as catalyst which comprises:

(a) distilling a first solvent from the oxidation reaction mixture containing 3-(substituted phenoxy)benzoic acid and cobalt compound;

(b) combining solvent-depleted reaction mixture from (a) with a second solvent which dissolves the 3-(substituted

phenoxy) benzoic acid and is capable of forming an immiscible layer with an aqueous solution of lower aliphatic carboxylic acid;

(c) combining solution of 3-(substituted phenoxy) benzoic acid from (b) with an aqueous solution of lower aliphatic carboxylic acid which dissolves the cobalt compound to extract the cobalt compound from the solution;

(d) separating the solution layer of 3-(substituted phenoxy) benzoic acid from the aqueous solution layer of lower aliphatic carboxylic acid and dissolved cobalt compound;

(e) separating the aqueous solution of lower aliphatic carboxylic acid from extracted cobalt compound resulting from steps (c) and (d); and

(f) recycling the first solvent recovered from (a) and the cobalt compound recovered from (e) to serve as solvent and catalyst respectively in the oxidation of an additional quantity of 3-(substituted phenoxy) toluene feed.

4,456,768

CHEMICAL SYNTHESIS

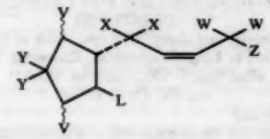
Josef Fried, Chicago, Ill., assignor to The University of Chicago, Chicago, Ill.

Continuation of Ser. No. 195,291, Oct. 8, 1980, Pat. No. 4,324,730, which is a continuation of Ser. No. 83,398, Oct. 10, 1979, abandoned, which is a continuation of Ser. No. 108,525, Dec. 31, 1979, abandoned. This application May 1, 1981, Ser. No. 259,740

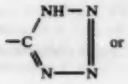
Int. Cl.[3] **C07C** *177/00;* **A61K** *31/557*

U.S. Cl. 562—503 **5 Claims**

1. A compound of the formula:



wherein Y, W and X may each be H or F; provided that at least one of Y, W and X is F; V may be hydroxy, acyloxy, lower alkoxy, hydroxy lower alkyl, or oxo: Z may be $—Z_1—E$ wherein: Z_1 is $(CH_2)_g—CH_2—CH_2—$, or $—(CH_2)_g—O—CH_2—$, or $—(CH_2)_g—CH_2—CF_2—$, or trans$—(CH_2)_g—CH=CH—$; wherein g is 0, 1 or 2; and E is $—COOX_1$, wherein X_1 is hydrogen, lower alkyl, cycloalkyl, aralkyl, phenyl, phenyl substituted with chloro or lower alkyl, an alkali metal or a substituted ammonium cation; or $—CH_2OH$; or



$—CH_2NL_2L_3$, wherein L_2 or L_3 are hydrogen, lower alkyl or $—COOX_1$ wherein X_1 is as defined above;

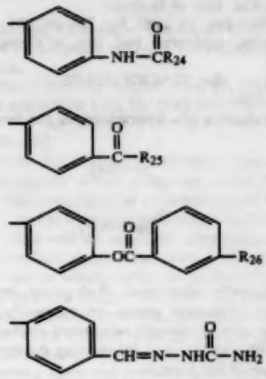
$—COL_4$, wherein L_4 is,

(a) amino of the formula $—NR_{21}R_{22}$, wherein R_{21} and R_{22} are hydrogen, alkyl of 1 to 12 carbon atoms inclusive, aralkyl of 7 to 12 carbon atoms inclusive, phenyl, phenyl substituted with 1, 2 or 3 chloro or alkyl substituents of 1 to 3 carbon atoms inclusive, or phenyl substituted with hydroxy carbonyl or alkoxy carbonyl of 1 to 4 carbon atoms inclusive; or

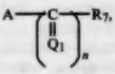
(b) carbonylamino of the formula, $—NR_{23}COR_{21}$, wherein R_{23} is hydrogen or alkyl of 1 to 4 carbon atoms and R_{21} is as defined above; or

(c) sulfonylamino of the formula $—NR_{23}SO_2R_{21}$, wherein R_{21} and R_{23} are as defined above; or

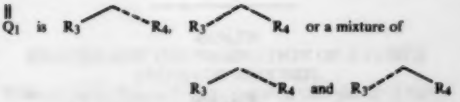
$—COOL_5$, wherein L_5 is p-substituted phenyl selected from the group consisting of:



wherein R_{24} is methyl, phenyl, acetamidophenyl, benzamidophenyl, or $—NH_2$; R_{25} is methyl, phenyl, $—NH_2$, or methoxy; and R_{26} is hydrogen or acetamido; and L is

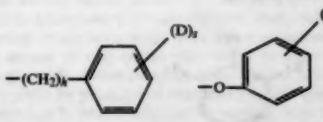


wherein n is 1 or 2; and A is —C≡C—, or trans—CH—C(-Halogen)—; and



wherein R_3 and R_4 may be H, OH, alkoxy, acyloxy, or fluoro with the proviso that one of R_3 and R_4 is fluoro only when the other is fluoro or hydrogen and when taken together R_3 and R_4 is oxo; and R_7 may be:

(a) $—(CH_2)_g—CH_3$, wherein g is 3, 4 or 5;



(b)

wherein h is 0, or 1; s is 0, 1, 2 or 3; and D is chloro, fluoro, trifluoromethyl, alkyl of one to 3 carbon atoms, inclusive, or with the proviso that not more than two D's are other than alkyl and the 1,5- and 1,15-lactones thereof; or

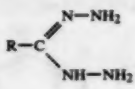
(c) $CH_2OC{=}CH—CH_2CH_3$; and wherein the acyl moieties herein are derived from hydrocarbon carboxylic acids of twelve carbon atoms or less; and wherein the aralkyl moieties herein are of from 7 to 12 carbon atoms.

4,456,769
PREPARATION OF HYDRAZIDINES

Gerhard Bonse, Cologne, and Thomas Schmidt, Haan, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 14, 1982, Ser. No. 387,906
Claims priority, application Fed. Rep. of Germany, Jul. 9, 1981, 3127042
Int. Cl.³ C07C *123/02*
U.S. Cl. 564—226 11 Claims

1. In the production of a hydrazidine of the formula



in which

R is an optionally substituted alkyl group, an optionally substituted cycloalkyl group, an optionally substituted aryl group or an optionally substituted aralkyl group,

or an acid addition salt thereof, by reacting the corresponding iminoalkyl ether of the formula

in which

R^1 is an optionally substituted alkyl group or an optionally substituted cycloalkyl group,

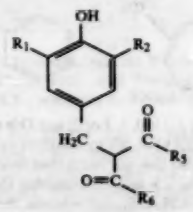
or an acid addition salt thereof, with hydrazine in a solvent, the improvement which comprises effecting the reaction using hydrazine hydrate in the presence of an inert organic solvent under reduced pressure and at a temperature between about −80° and +100° C.

4,456,770
CHEMICAL PROCESS FOR PREPARING 1,3 DIKETONES

Charles R. Everly, and Jerry M. Roper, both of Baton Rouge, La., assignors to Ethyl Corportation, Richmond, Va.

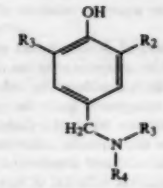
Filed Sep. 7, 1982, Ser. No. 415,019
Int. Cl.³ C07C *45/61*
U.S. Cl. 568—315 30 Claims

1. A process for the preparation of a compound having the general structural formula



(III)

which comprises reacting a compound of the general structural formula



(I)

with a 1,3-diketone of the general structural formula

$R_5COCH_2COR_6$ (II)

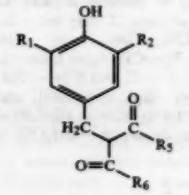
in the presence of a basic substance, which is an alkali metal hydroxide, an alkali metal salt of a weak acid, an alkaline earth metal hydroxide, an alkaline earth metal salt of a weak acid, amine bases or mixtures of the same, wherein R_1 and R_2 are the same or different and are hydrogen or hydrocarbyl radicals having up to at least 40 carbon atoms with the provision that at least one of R_1 or R_2 must be other than hydrogen, R_3 and R_4 are the same or different and are linear, branched or unbranched alkyl, aralkyl or cycloalkyl radicals having up to at least 20 carbon atoms, or R_3 and R_4 taken together form a piperidine, morpholine, or pyrrolidine ring, and R_5 and R_6 are the same or different and are linear or branched alkyl radicals having up to at least 20 carbon atoms.

4,456,771
CHEMICAL PROCESS FOR PREPARING 1,3-DIKETONES

Charles R. Everly, and Jerry M. Roper, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

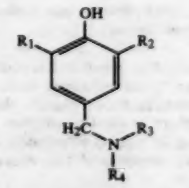
Filed Sep. 7, 1982, Ser. No. 415,020
Int. Cl.³ C07C *45/61*
U.S. Cl. 568—315 31 Claims

1. A process for the preparation of a compound having the general structural formula



(IV)

which comprises reacting a compound of the general structural formula



(I)

with a 1,3-diketone of the general structural formula

$R_5COCH_2COR_6$ (II)

and an alkyl halide of the general formula

R_7X (III)

in the presence of an alkali metal hydride or an alkaline earth metal hydride wherein R_1 and R_2 are the same or different and are hydrogen or hydrocarbyl radicals having up to at least 40 carbon atoms with the provision that at least one of R_1 or R_2 must be other than hydrogen, R_3 and R_4 are the same or different and are linear, branched or unbranched alkyl, aralkyl or cycloalkyl radicals having up to at least 20 carbon atoms, or R_3 and R_4 taken together form a piperidine, morpholine, or pyrrolidine ring, R_5 and R_6 are the same or different and are linear or branched alkyl radicals having up to at least 20 carbon atoms; R_7 is a linear or branched monovalent alkyl radical having up to at least 20 carbon atoms and X is chlorine, bromine or iodine.

4,456,772

PROCESS FOR THE PREPARATION OF OPTIGNALLY SUBSTITUTED FLUORO-NITRO-BENZALDEHYDES

Gerhard Marzolph, Cologne, and Heinz U. Blank, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 3, 1982, Ser. No. 354,424

Claims priority, application Fed. Rep. of Germany, Mar. 24, 1981, 3111421

Int. Cl.³ C07C *79/36, 45/63*

U.S. Cl. 568—424 10 Claims

1. A process for the preparation of 4-fluoro-3-nitrobenzaldehyde, 2-fluoro-5-nitrobenzaldehyde or 5-fluoro-2-nitrobenzaldehyde which comprises contacting 4-chloro-3-nitrobenzaldehyde, 2-chloro-5-nitrobenzaldehyde or 5-chloro-2-nitrobenzaldehyde with an alkali metal fluoride in the presence of a polar aprotic solvent which is an acid amide which is completely substituted at the nitrogen, a sulphoxide, a glycol ether, a polyglycol ether, a nitrile or nitrobenzene at a temperature from 50° to 250° C. whereby the chloro-nitrobenzaldehyde reactant is converted to the corresponding fluoro-nitrobenzaldehyde product.

4,456,773

PROCESS FOR THE PREPARATION OF POLYOXYALKYLENE ETHERS

Jürgen Fock, Düsseldorf, Fed. Rep. of Germany, assignor to Th. Goldschmidt AG, Essen, Fed. Rep. of Germany

Filed Sep. 10, 1982, Ser. No. 416,554

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1981, 3142041

Int. Cl.³ C07C *41/02, 43/13*

U.S. Cl. 568—608 8 Claims

1. In a process for the preparation of polyoxyalkylene ethers having the formula

$$R^1O-[C_nH_{2n}O-]_xM$$

in which

R^1 is an alkyl radical with 1 to 4 carbon atoms, an alkylene radical, an aryl radical, or an alkaryl radical,

M is an alkali cation,

n is any number from 2 to 3, and

x is a whole number,

by the stoichiometric polymerization of alkylene oxides or their mixtures having the formula $C_nH_{2n}O$ on alkali alcoholates having the formula MOR^1 at temperatures of 60° C. to 150° C., the improvement which comprises said alkali alcoholates being mixtures of 1 to 20 mole percent of potassium alcoholate and 99 to 80 mole percent of sodium alcoholate.

4,456,774

BULK SEPARATION OF POLYHYDRIC ALCOHOLS BY SELECTIVE ADSORPTION ON ZEOLITIC MOLECULAR SIEVES

John D. Sherman, Chappaqua, and Chien C. Chao, Millwood, both of N.Y., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation of Ser. No. 329,608, Dec. 10, 1981, abandoned. This application Oct. 13, 1983, Ser. No. 540,915

Int. Cl.³ C07C *29/76, 31/26*

U.S. Cl. 568—872 15 Claims

1. A process for separating mannitol from galactitol by selective adsorption which comprises contacting a mixture comprising said compounds at a temperature of from about 30° C. to 110° C. and at a pressure sufficient to maintain the system in the fluid phase with an adsorbent composition comprising at least one crystalline aluminosilicate zeolite of type X in which the zeolitic cations which occupy more than 55% of the available cation sites are barium; whereby the mannitol is selectively adsorbed thereon, removing the non-adsorbed portion of said mixture from contact with the zeolite adsorbent, and desorbing the mannitol therefrom by contacting said adsorbent with a desorbing agent and recovering the desorbed mannitol.

4,456,775

CATALYTIC PROCESS FOR MANUFACTURING ALCOHOLS BY HYDROGENOLYSIS OF CARBOXYLIC ACID ESTERS

Christine Travers, Rueil-Malmaison; Chan Trinh Dinh, Le Vesinet; Roger Snappe, Sevres, and Jean-Paul Bournonville, Chatou, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed May 24, 1983, Ser. No. 497,631

Claims priority, application France, May 24, 1982, 82 09099

Int. Cl.³ C07C *29/136*

U.S. Cl. 568—885 16 Claims

1. In a process for manufacturing alcohols, wherein an ester of a carboxylic acid is treated with hydrogen in the presence of a catalyst, the improvement wherein the catalyst comprises a carrier, rhodium, and at least one second element, being tin, germanium, lead or a mixture thereof.

4,456,776

PROCESS FOR THE PRODUCTION OF A LOWER ALIPHATIC ALCOHOL

Wilhelm Neier; Werner Webers, and Wolf Ostwald, all of Rheinberg, Fed. Rep. of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 274,685, Jun. 17, 1981, abandoned. This application Jan. 13, 1983, Ser. No. 457,827

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024146

Int. Cl.³ C07C *29/04*

U.S. Cl. 568—899 7 Claims

1. A process for the continuous production of a lower aliphatic alcohol having from 3 to 5 carbon atoms by the direct catalytic hydration of a lower aliphatic olefin having from 3 to 5 carbon atoms with water which comprises reacting a reactant stream of said olefin with water in the presence of a strongly acidic cation exchange resin catalyst in a tubular fixed bed reactor by passing said reactants through said catalyst bed in upstream flow at a temperature ranging from about 120° C. to 180° C., at a pressure from about 40 to 200 bar and the water/olefin mole ratio ranging from about 0.5 to 10 moles of water per mole of said olefin, said tubular fixed bed reactor being characterized by having a cross-sectional diameter greater than 150 mm and said process having the tendency of substantially lowering the reaction temperature in said catalyst bed and impairing the reaction efficiency as said reactants pass through said catalyst bed, the step which comprises intimately contacting said heated reactant stream comprising said olefin and said water until said olefin has been presaturated with from

about 1 to 1.8 weight percent of water prior to introducing said reactant stream into said reactor in order to maintain a relatively steady reaction temperature and efficient conversion of said olefin to said alcohol in said reactor.

4,456,777

PROCESS FOR THE PREPARATION OF 2-CHLORO-4-NITROTOLUENE

Gerd-Michael Petruck, Erkrath, Fed. Rep. of Germany; Paul R. Wambach, deceased, late of Leverkusen, Fed. Rep. of Germany (by Christa Wambach, heiress), and Adolf Wissner, Leverkusen, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jun. 28, 1982, Ser. No. 392,450

Claims priority, application Fed. Rep. of Germany, Jul. 18, 1981, 3128442

Int. Cl.³ C07C *79/12*

U.S. Cl. 568—937 **9 Claims**

1. A process for the preparation of 2-chloro-4-nitrotoluene which comprises chlorinating 4-nitrotoluene at a temperature from the melting point of said 4-nitrotoluene up to 120° C. with 0.6 to 1.2 mols of chlorine per mol of 4-nitrotoluene in a reaction mixture consisting essentially of said 4-nitrotoluene, said chlorine and 0.1 to 10 percent by weight of iodine relative to said 4-nitrotoluene.

4,456,778

SEPARATING THE CHLORINATION PRODUCTS FROM THE REACTION GASES OBTAINED BY THE CHLORINATION OF METHANE AND METHYL CHLORIDE

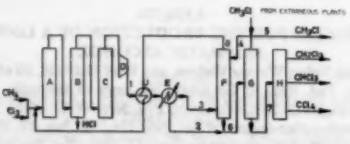
Michael Zölffel, Marl, and Johann Gaube, Roddorf, both of Fed. Rep. of Germany, assignors to Chemische Werke Huels Aktiengesellschaft, Marl, Fed. Rep. of Germany

Continuation of Ser. No. 137,863, Apr. 7, 1980, abandoned, which is a continuation of Ser. No. 659,791, Feb. 12, 1976, abandoned. This application Sep. 10, 1981, Ser. No. 300,785

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1975, 2507505

Int. Cl.³ C07C *17/10*

U.S. Cl. 570—255 **12 Claims**



1. In a continuous process for chlorinating a mixture of methane and methyl chloride, and maximizing the yield of methylene chloride, wherein a mixture of methane and methyl chloride is reacted with chlorine in the gas phase; the effluent gas stream is freed of HCl; the HCl-free stream is dried; and the dry, HCl-free effluent gas stream is fractionated to obtain: a recycle gas stream, consisting essentially of methane and methyl chloride, which is recycled to the chlorination step; and a liquid product stream, containing methyl chloride, substantially all of the methylene chloride produced in the reaction, chloroform and carbon tetrachloride, said liquid product stream being further fractionated into its components, including a methylene chloride product stream,

the improvement which comprises

(a) cooling said dry, HCl-free effluent gas stream by indirect heat exchange, at a pressure of 5–15 bars, to a temperature of 10°–40° C., thereby effecting a partial condensation thereof, and recovering (i) a residual gaseous stream containing methylene chloride and predominating in methane and methyl chloride, and (ii) a liquid condensate stream containing methyl chloride, methylene chloride, chloroform and carbon tetrachloride:

(b) contacting said residual gaseous stream (i) from step (a) countercurrently with a stream of liquid methyl chloride having an inlet temperature of about 30° C., in the absence of external indirect cooling, the amount of said liquid methyl chloride stream being from 1.4 to 3 times the amount of methylene chloride in said residual gaseous stream, whereby vaporization of liquid methyl chloride, direct internal cooling of the gas stream and condensation of gaseous methylene chloride are effected, thereby incorporating substantially all the methylene chloride from said residual gaseous stream into the liquid phase, and recovering (iii) a gas stream which is recycled as said recycle gas stream, and (iv) a liquid phase stream;

(c) combining said liquid condensate stream (ii) from step (a) with said liquid phase stream (iv) from step (b) to form said liquid product stream; and

(d) fractionating said liquid product stream from step (c) and recovering a liquid methyl chloride stream, at least a portion of which is recycled to step (b), and a sump product stream which is further fractionated into its component product streams including said methylene chloride product stream.

4,456,779

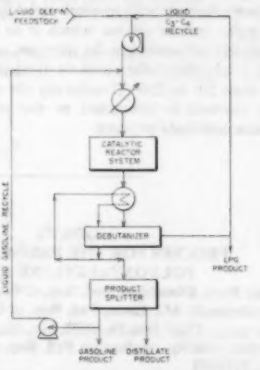
CATALYTIC CONVERSION OF OLEFINS TO HIGHER HYDROCARBONS

Hartley Owen, Belle Mead; Susan K. Marsh, Mt. Holly, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 26, 1983, Ser. No. 488,834

Int. Cl.³ C07C *3/03*

U.S. Cl. 585—415 **12 Claims**



1. A continuous process for converting lower olefins to higher hydrocarbons with optional operation to maximize either distillate or gasoline product comprising:

(a) combining a pressurized liquid olefinic feedstock containing a substantial fraction of lower olefins with a pressurized liquid low alkane stream comprising a major fraction of C_3–C_4 alkanes;

(b) pre-heating the combined olefinic stream and lower alkane stream to a temperature of at least about 230° C.;

(c) contacting the pre-heated combined olefinic stream with an acid ZSM-5 type catalyst in a pressure reactor zone to convert a major portion of the lower olefin fraction to C_5^+ hydrocarbons in the gasoline boiling and distillate range;

(d) cooling the reactor effluent from step (c);

(e) debutanizing the cooled reactor effluent directly at less than reactor pressure to recover condensed lower alkane stream and a liquid C_5^+ hydrocarbon stream, including

heat exchanging the reactor effluent indirectly with the liquid C_5^+ hydrocarbon stream in a debutanizer reboiler section;

(f) recycling and pumping to reactor pressure at least a portion of the condensed lower alkane stream to step (a); and

(g) fractionating the C_5^+ hydrocarbon stream to obtain a distillate product fraction and a gasoline-boiling range fraction.

4,456,780

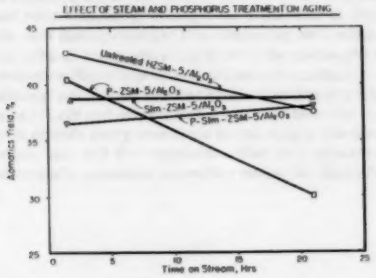
EXTENDING ZEOLITE CATALYST LIFE FOR DISPROPORTIONATION BY TREATING WITH PHOSPHORUS AND/OR STEAM

Lewis B. Young, Skillman, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 403,756, Jul. 30, 1982, which is a continuation-in-part of Ser. No. 195,032, Oct. 8, 1980, Pat. No. 4,356,338, which is a division of Ser. No. 061,223, Jul. 27, 1979. This application Jul. 20, 1983, Ser. No. 515,706

Int. Cl.³ C10G *11/05, 35/00*

U.S. Cl. 585—475 **8 Claims**



1. A process for carrying out hydrocarbon disproportionation conversion reactions over a catalyst comprising a crystalline zeolite characterized by a silica to alumina molar ratio of at least 12 and a Constraint Index of from about 1 to 12, the improvement which comprises:

pretreating said catalyst to reduce the rate of catalyst aging and detrimental formation of coke thereon which occurs during said conversion reactions, by reacting said catalyst with a phosphorus-containing compound to deposit between about 2% and 15% by weight of phosphorus on said catalyst and by subjecting said catalyst to an atmosphere comprising from about 5% to 100% of steam at a temperature from about 250° C., to about 1000° C., for a period of from about 15 minutes to about 100 hours.

4,456,781

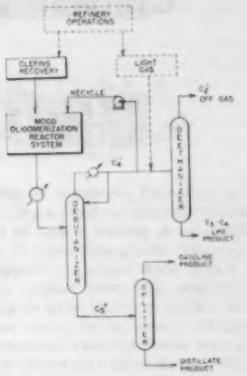
CATALYTIC CONVERSION SYSTEM FOR OLIGOMERIZING OLEFINIC FEEDSTOCK TO PRODUCE HEAVIER HYDROCARBONS

Susan K. Marsh, Mt. Holly; Hartley Owen, Belle Mead, and Bernard S. Wright, East Windsor, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 26, 1983, Ser. No. 488,823

Int. Cl.³ C07C *2/02*

U.S. Cl. 585—533 **13 Claims**



1. In a continuous catalytic process for oligomerizing lower olefins to heavier hydrocarbons wherein a continuous liquid olefinic feedstream is diluted with a liquid alkane stream and contracted with oligomerization catalyst, the improvement which comprises:

cooling catalytically converted effluent, fractionating the effluent to obtain a condensed lower aliphatic recycle stream, a liquid C_3–C_4 product stream, a liquid product stream consisting essentially of C_5^+ hydrocarbons and a gaseous C_2^- gaseous stream by the sequential fractionation steps of

debutanizing the cooled effluent to obtain the liquid C_5^+ hydrocarbon stream and condensed lower aliphatic stream;

de-ethanizing a portion of the lower aliphatic stream to recover gaseous ethane stream and a C_3–C_4 alkane product stream; and

recycling at least a portion of the condensed aliphatic stream from the debutanizing step for dilution of the olefinic feedstream.

4,456,782

SOLAR CELL DEVICE

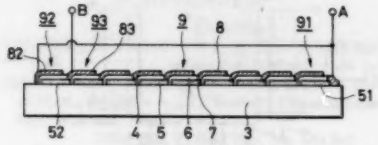
Masaharu Nishiura; Hiroshi Sakai; Masahide Miyagi; Yoshiyuki Uchida, and Hiromu Haruki, all of Kanagawa, Japan, assignors to Fuji Electric Co., Ltd., Kanagawa, Japan

Filed Sep. 20, 1982, Ser. No. 420,216

Claims priority, application Japan, Mar. 20, 1981, 56-40762; Mar. 24, 1981, 56-42942

Int. Cl.³ H01L *31/06*

U.S. Cl. 136—244 14 Claims



1. A solar cell device, comprising; a plurality of solar cells each being composed of a first conductive film, a semiconductor film including a junction therein, and a second conductive film, said solar cells being arranged on a substrate at desired intervals, said first conductive film contacting said substrate, said solar cells all being connected in series by connecting said first conductive film of one cell to said second conductive film of an adjacent cell in turn, said first conductive film of a first of said series of cells and said second conductive film of a last of said series of cells being connected to one output terminal of said device, and said first conductive film of a selected cell being electrically connected to another output terminal of said device.

4,456,783

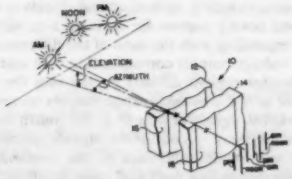
MULTIELEMENT OPTICAL PANEL

James G. Baker, Bedford, N.H., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Nov. 23, 1982, Ser. No. 444,059

Int. Cl.³ H01L *31/04;* F24J *3/02;* G02B *3/00*

U.S. Cl. 136—246 37 Claims



1. An optical panel comprising a pair of thin refracting plates each of which includes a series of regularly spaced cylindrical lenticules, said plates being arranged in opposed spaced apart relationship so that their cylindrical lenticules optically align as associated pairs, each associated pair of said cylindrical lenticules being optically configured to form a well-corrected line image of a distant point source and having a flat tangential field over the width of the last lenticular element of the pair and over a substantial field angle so that each line image formed by an associated pair of elements always lies in substantially the same plane.

4,456,784

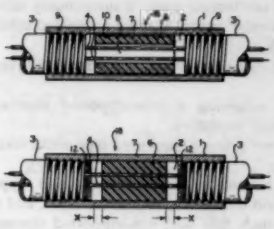
CONDUIT SEALING CONNECTOR

Gary S. Klein, Cleveland, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 26, 1982, Ser. No. 362,566

Int. Cl.³ H02G *3/04, 15/013*

U.S. Cl. 174—23 R 18 Claims



1. A connector assembly for connecting the ends of at least two conduits together having at least one electrical conductor extending therebetween in such a manner as to provide a barrier against the flow of vapor through the conduits, said connector assembly comprising a sleeve made from a heat stable material having a chamber therewithin enclosed by a wall of the sleeve having an inner and outer surface with at least a portion of the inner surface facing towards the conductor, said sleeve having respective openings therein surrounded by respective walls of the sleeve for communicating with the chamber that are respectively dimensionally adapted to enable the ends of the respective conduits to be inserted therethrough into the chamber, means associated with the respective openings for connecting the sleeve to the respective conduits which enable the conductor to extend through the chamber from one conduit to the other in the manner desired, an expandable material disposed in the chamber that is adapted to expand in response to exposure of the sleeve to an amount of heat sufficient to cause the expandable material to expand and engulf the conductor and fill the chamber sufficiently to provide a barrier against the flow of vapor between the conduits without damage to the conductor, and means disposed within the chamber to prevent the expandable material from expanding into the ends of the conduits.

4,456,785

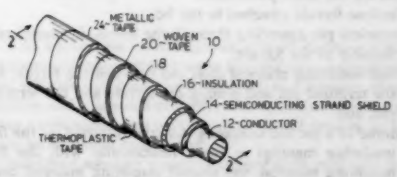
SHIELDED CABLE AND METHOD OF MANUFACTURE THEREOF

James Kushner, East Greenwich; Walter F. Constantine, Warwick; Dhiru Radadia, Lincoln, and Louis S. Codega, Barrington, all of R.I., assignors to Gulf & Western Manufacturing Company, Southfield, Mich.

Filed Sep. 17, 1982, Ser. No. 419,358

Int. Cl.³ H01B *9/02, 13/08, 7/02*

U.S. Cl. 174—105 SC 7 Claims



1. A shielded cable comprising:

a conductor;

a layer of insulation surrounding said conductor;

a first helically wound unsupported thermoplastic tape surrounding and bonded to said insulation layer;

a second helically wound supported tape surrounding and bonded to said first tape, the bond between said first and second tapes being stronger than said bond between said insulation and said first tape such that said first and second tapes are peelable helically and as a unit from said insulation, said first and second tapes being substantially free of gaps due to tape overlap; and

a layer of conducting material surrounding said second tape.

7. A method of manufacturing a shielded cable comprising the steps of:

providing a conductor having a surrounding layer of insulation;

helically wrapping a non-supported thermoplastic tape about said insulation;

helically wrapping a supported tape about said thermoplastic tape;

applying a metallic tape shield about said supported tape;

heating said conductor, insulation, tapes, and metallic tape shield such that said non-supported thermoplastic tape softens and flows into any gaps caused by overlapping portions thereof, a relatively weak bond being formed between said insulation and said non-supported tape and a relatively strong bond being formed between said non-supported tape and said supported tape whereby said non-supported tape and said supported tape can be peeled helically as one layer from said insulation when said metallic tape shield is removed.

4,456,786

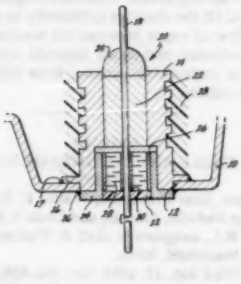
TERMINAL ASSEMBLY FOR HEART PACEMAKER

James C. Kyle, 24372 Via San Clemente, Mission Viejo, Calif. 92675, assignor to James C. Kyle, Roseburg, Oreg.

Continuation of Ser. No. 95,613, Nov. 19, 1979, abandoned. This application Nov. 16, 1981, Ser. No. 322,013

Int. Cl.³ H01B *17/26;* **C03C** *27/02*

U.S. Cl. 174—152 GM **32 Claims**



1. In combination in a terminal assembly for a heart pacemaker,

a lid for the heart pacemaker,

a hollow ferrule attached to the lid,

a terminal pin extending through the ferrule in spaced relationship to the ferrule,

a first insulating material disposed between the ferrule and the terminal pin and sealing the ferrule and the terminal pin, and

a dome of a second insulating material disposed on the first insulating material in fused relationship with the first insulating material, the second insulating material being formed from the same chemicals as the first insulating material but in slightly different percentages than the first insulating material,

the second insulating material having non-wetting characteristics relative to the ferrule to provide for the formation of the dome.

4,456,787

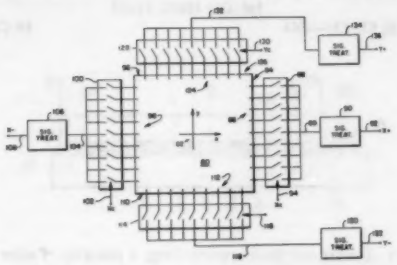
ELECTROGRAPHIC SYSTEM AND METHOD

Philip A. Schlosser, and Stanley F. Quayle, both of Columbus, Ohio, assignors to Scriptel Corporation, Hilliard, Ohio

Filed Jul. 6, 1982, Ser. No. 395,261

Int. Cl.³ G08C *21/00*

U.S. Cl. 178—19 **8 Claims**



1. An electrographic system comprising:

an electrically insulative substrate;

a resistive layer exhibiting substantially uniform electrical resistance supported upon said insulative substrate and having an operational region extending in an x-coordinate sense between first and second parallel, spaced apart border regions, and extending in a y-coordinate sense between third and fourth parallel, spaced-apart border regions;

stylus means for generating localized electromagnetic radiation from an a.c. source to effect the propagation thereof toward said resistive layer from positions selectively spaced therefrom to effect interaction therewith;

first, discrete, spaced-apart contacts electrically coupled with said resistive layer at said first border region;

second, discrete, spaced-apart contacts electrically coupled with said resistive layer at said second border region;

third, discrete, spaced apart contacts electrically coupled with said resistive layer at said third border region;

fourth discrete, spaced-apart contacts electrically coupled with said resistive layer at said fourth border region;

signal treating means including voltage converter means having an input for receiving electrical signals generated by said stylus means interaction and conveyed thereto for providing an alternating voltage output corresponding therewith, means responsive to said alternating voltage output to derive a constant voltage output corresponding therewith and means responsive to said constant voltage outputs corresponding with electrical signals at said first and second border regions for deriving x-coordinate signals corresponding with the ratio of the difference of said constant voltage outputs corresponding with said first and second border regions divided by the sum thereof, and responsive to said constant voltage outputs corresponding with electrical signals at said first and fourth border regions for deriving y-coordinate signals corresponding with the ratio of the difference of said constant voltage outputs corresponding with said third and fourth border regions divided by the sum thereof; and

analog switching means including first discrete low impedance switches, each coupled between a selected one of said first contacts and said signal treating means voltage converter means input and actuable to effect conveyance of said electrical signals thereto, second discrete low impedance switches, each coupled between a selected one of said second contacts and said signal treating means voltage converter means input and actuable to effect conveyance of said electrical signals thereto, third discrete low impedance switches, each coupled between a selected one of said third contacts and said signal treating

means voltage converter means input and actuable to effect conveyance of said electrical signals thereto, fourth discrete low impedance switches, each coupled between a selected one of said fourth contacts and said signal treating means voltage converter means input and actuable to effect conveyance of said electrical signals thereto, said switching means effecting a mutual open circuit isolation of said third and fourth contacts when said first and second switches are actuated and effecting a mutual, open circuit isolation of said first and second contacts when said third and fourth switches are actuated.

4,456,788

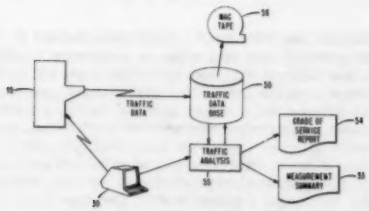
TELECOMMUNICATION TRUNK CIRCUIT REPORTER AND ADVISOR

Samuel J. Kline, Sherborn, and Richard E. Little, Dedham, both of Mass., assignors to GTE Business Communication Systems Inc., Waltham, Mass.

Filed Dec. 1, 1982, Ser. No. 445,863

Int. Cl.³ H04M *3/36*

U.S. Cl. 179—7.1 R **3 Claims**



1. In a telecommunication network having a plurality of tandem node switches interconnected by a plurality of trunk groups, a system for mechanically generating traffic data reports and recommending additions or deletions of trunks in an unqueued trunk group necessary to maintain an optimum size network, said system comprising:

means for reading and storing unqueued trunk group measurement packages provided by each tandem node switch;

means for selecting as data days those days for which the average usage of a selected set of unqueued trunk groups exceeds a specified threshold;

means for determining the average busy hour;

means for determining the average offered load;

means for calculating the amount of busy hour average blocking; and

means for calculating the number of unqueued trunks to be added or deleted so that the calculated busy hour blocking is approximately equal to a target busy hour average blocking.

4,456,789

AUDIO TELECONFERENCING

Ian S. Groves; David R. Guard; John G. Bunting; Christopher E. Rowlands, all of Ipswich; Edwin J. Powter, Saxmundham; David W. J. Holmes, Stowmarket, and Graham J. Trott, Felixstowe, all of England, assignors to The Post Office, London, England

Filed Mar. 5, 1979, Ser. No. 17,280

Claims priority, application United Kingdom, Mar. 7, 1978, 9022/78

Int. Cl.³ H04M *3/56*

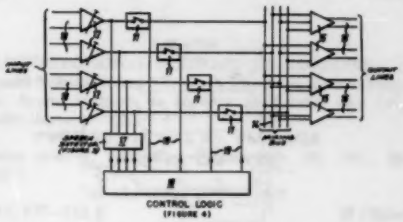
U.S. Cl. 179—18 BC **14 Claims**

1. A control unit for controlling operation of a plurality of audio teleconference terminals comprising:

a plurality of inputs, each being for connection to a respective teleconference terminal so that it can receive speech signals therefrom,

switching means having high and low impedance conditions connecting each input to a plurality of outputs, each output being associated with a particular input and being for connection to a teleconference terminal,

the switching means being operative to connect the input associated with a low impedance-conditioned switching means to all outputs other than the one with which it is associated, and



control means, responsive to speech signals from said inputs, connected to control said switching means such that at least some of said inputs at which speech signals are received are connected to said outputs whereby at least two terminals can be connected in open loop teleconference and the remaining terminals can receive the conference.

4,456,790

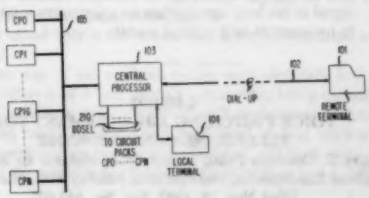
AUTOMATED HARDWARE INVENTORY SYSTEM

Richard F. J. Soyack, Red Bank, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 8, 1982, Ser. No. 346,649

Int. Cl.³ G06F *13/00, 15/24;* H04Q *3/54, 9/02*

U.S. Cl. 179—18 ES **1 Claim**



1. In a telephone communication system having a processor in communication with a remote terminal over a telephone line and wherein said processor is common to a plurality of system devices and is adapted to control the operation of said devices over a communication path common to said devices, an inventory arrangement comprising:

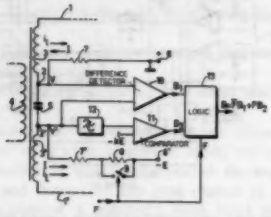
individual memory means associated with each said device, said memory means having stored therein information bits unique to the identity of said associated device, and

means controlled by data supplied by said remote terminal to said processor for enabling selected ones of said memory means to provide said stored unique identity information to said communication path.

4,456,791
OFF-HOOK DETECTOR WITH REDUCED SENSITIVITY TO COMMON MODE

Alain Forestier, Lannion, France, assignor to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Mar. 9, 1982, Ser. No. 356,604
Claims priority, application France, Mar. 11, 1981, 81 04850
Int. Cl.³ H04M *3/22*
U.S. Cl. 179—18 FA **1 Claim**



1. An off-hook detector for use in a subscriber line interface circuit to provide a loop signal to indicate the open-loop or closed-loop status of a subscriber line, comprising;

a transmission bridge comprising a first terminal and a second terminal, a first branch connected between said first terminal and one side of a central battery, a second branch connected between said second terminal and the other side of said central battery, said branches normally being symmetrical;

means for introducing an asymmetry in said second branch in response to a control signal;

a difference detector having inputs connected to said two terminals and an output that supplies a first logic signal the state of which indicates the open-loop or closed-loop status of the subscriber line;

a comparator having a first input connected via a low pass filter to said second terminal, a second input connected to a voltage threshold, and an output that produces a second logic signal the state of which indicates the open-loop or closed-loop status of the subscriber line;

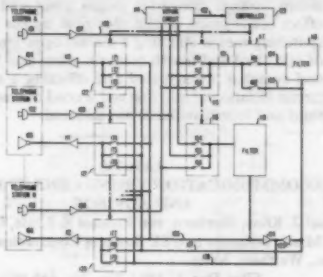
a logic circuit connected to said difference detector and said comparator and responsive to said control signal to provide said first logic signal as the loop signal when said branches are symmetrical and to provide said second logic signal as the loop signal when an asymmetry is introduced in response to said control signal.

4,456,792
VOICE SWITCHING ARRANGEMENT FOR TELEPHONE CONFERENCING

Jeofry S. Courtney-Pratt, Locust, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 18, 1982, Ser. No. 442,607
Int. Cl.³ H04M *3/56*
U.S. Cl. 179—18 BC **5 Claims**

1. In a telephone system, a voice switching arrangement for processing simultaneous speech signals among multiple stations in a frequency channel on a telephone line, the arrangement comprising first and second filter banks centrally disposed and operably connectable to the multiple stations, each bank comprising a plurality of passband filters with the passbands of the respective banks being complementary and within the frequency channel, the first and second filter banks being removed from the speech signal path when the speech signal is originating only from a first station that has seized the telephone line, the first filter bank being inserted in the speech signal path of the first station that has seized the telephone line and the second filter bank inserted in the speech signal path of a second interrupting station in response to the speech signal

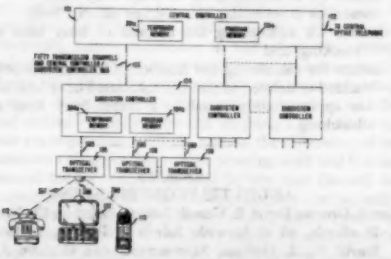


from the interrupting station such that the first station and the interrupting station receive the other's speech signals.

4,456,793
CORDLESS TELEPHONE SYSTEM

William E. Baker, Holmdel; Fritz E. Froehlich, Little Silver, and Hans G. Mattes, Indianapolis, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 9, 1982, Ser. No. 386,722
Int. Cl.³ H04M *1/72, 3/22*
U.S. Cl. 179—99 R **16 Claims**



15. A cordless communication system comprising:

a central controller for switching communications, a plurality of subsystem controllers connected to the central controller, each subsystem controller having a plurality of terminals associated therewith, each terminal having a unique address, each subsystem controller periodically polling the terminals associated therewith, the subsystem controller reporting the address of a nonresponding terminal to the central controller, the central controller responding to the report by requesting all of the subsystem controllers to request a response from the nonresponding terminal.

4,456,794

FASTENING ARRANGEMENT FOR A HANDSET CASE HALVES

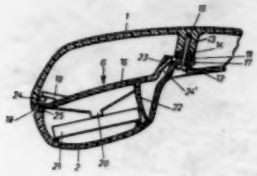
Carl-Axel Strömer, Bromma; Erling Tronslien, Tyresö, and Jörgen F. Lindberg, Stockholm, all of Sweden, assignors to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

PCT No. PCT/SE80/00280, 371 Date Jun. 4, 1982, 102(e) Date Jun. 4, 1982, PCT Pub. No. WO82/01632, PCT Pub. Date May 13, 1982

PCT Filed Nov. 6, 1980, Ser. No. 384,977

Int. Cl.³ H04M *1/03*

U.S. Cl. 179—103 9 Claims



1. A handset comprising a lower case part adapted for receiving a transducer, an upper case part, fastening means for joining the upper and lower case parts together and clamping means engaging said parts for pressing said parts together upon tightening of said fastening means while pressing said transducer against the lower case part, said clamping means including a clamping body acted on by said fastening means during tightening thereof to be displaced from an initial position to a displaced position, said clamping body having a sliding surface and one of said case parts including a support on which said sliding surface travels during tightening of said fastening means, said clamping body including projection means spaced from said sliding surface which is moved along a diagonal path as said clamping body travels to said displaced position, said upper case part including flange means facing said projection means on said clamping body for being engaged by said projection means to clamp said case parts together when the clamping body has been moved to its displaced position, said clamping body further including means for pressing said transducer against said lower case part when said clamping body has been moved to its displaced position concurrently with the clamping of the case parts together by the projection means and the flange means.

4,456,795

BEHIND-THE-EAR TYPE HEARING AID

Osamu Saito, Akishima, Japan, assignor to Rion Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1982, Ser. No. 343,334

Claims priority, application Japan, Feb. 13, 1981, 56-19016

Int. Cl.³ H04R *25/02*

U.S. Cl. 179—107 H 11 Claims

1. A behind-the-ear type hearing aid comprising a main body having a generally rectangular cross section and a rear end portion in the form of a pentahedron terminating at a bottom surface forming one surface of said pentahedron, a microphone for use with normal conversation disposed within said main body and a sound passageway disposed within said main body so as to reach said microphone, a close talking microphone disposed within said main body, and a pair of sound passageways disposed within a rear portion of said main body so as to reach said close talking microphone, said pair of sound passageways opening on two of five surfaces defining the pentahedral rear end portion of said main body.

4,456,796

UNIDIRECTIONAL ELECTRET MICROPHONE

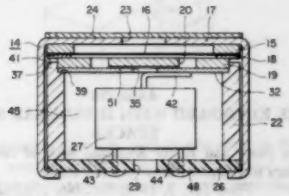
Sadayoshi Nakagawa, and Mitsuharu Shinohara, both of Fukuoka, Japan, assignors to Hosiden Electronics Co., Ltd., Osaka, Japan

Filed Mar. 18, 1982, Ser. No. 359,555

Claims priority, application Japan, Mar. 25, 1981, 56-42922[U]

Int. Cl.³ H04R *19/01, 19/04*

U.S. Cl. 179—111 E 14 Claims



1. A unidirectional electret microphone comprising:

a tubular case having at one end thereof a front end plate formed integrally therewith, said front end plate having a front sound hole therein;

a diaphragm disposed in the case in parallel relation to said front end plate;

a back electrode disposed in the case in parallel relation to said diaphragm, said back electrode having at least one sound hole therein, and one of said back electrode and said diaphragm being formed as an electret;

a partition wall in said case, said partition wall having its front surface in contact with the rear surface of said back electrode, the said partition wall having at least one sound hole therein disposed in opposing relation to said rear surface of said back electrode;

a rear sound hole in the case at the back of the partition wall; and

at least one of the surfaces of the back electrode and the partition wall which contact one another being formed to define at least one air path of small predetermined dimensions, said air path being positioned in said surface to acoustically couple the sound hole of said back electrode and the sound hole of said partition wall to one another.

4,456,797

SUBMERSIBLE PERSONAL STEREO SYSTEM

Eric E. Olsen, 3460 N. Dousman St., Milwaukee, 53212

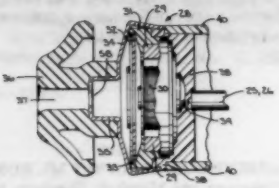
Filed Nov. 18, 1982, Ser. No. 421,813

Int. Cl.³ H04R *1/44*

U.S. Cl. 179—156 R 4 Claims

4. A waterproof earphone for use with a personal stereo system, said earphone comprising a hermetically sealed housing containing the operative components of the earphone including a sound generating diaphragm and an outwardly extending pliable sleeve, said sleeve being hermetically sealed

at one end to the housing for transmitting sound from the diaphragm through the sleeve, the other end of said sleeve



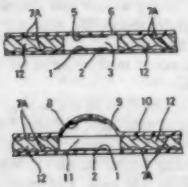
being open and available to form a hermetic seal with the ear canal of a user.

4,456,798

PANEL KEYBOARD WITH IRREGULAR SURFACED SPACER

Shoichiro Iwai, and Eiichi Kameda, both of Inashiki, Japan, assignors to Nippon Mektron Ltd., Japan

Filed Jun. 5, 1981, Ser. No. 271,042
Claims priority, application Japan, Sep. 18, 1980, 55-129673
Int. Cl.³ H01H *13/70*
U.S. Cl. 200—5 A **6 Claims**



1. A switch assembly comprising:

first circuit means, said first circuit means comprising a flexible planar nonconductive substrate having a conductive circuit pattern supported on at least a first surface thereof;

second circuit means, said second circuit means including a nonconductive substrate having a conductive circuit pattern supported on at least a first surface thereof, said circuit pattern of said second circuit means facing said circuit pattern of said first circuit means and being at least partly in registration therewith;

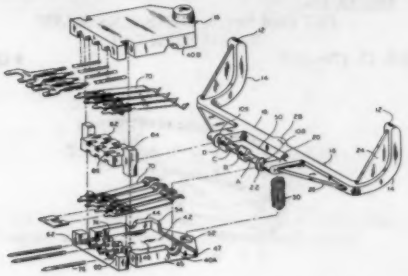
nonconductive spacer means, said spacer means being disposed between said first and said second circuit means, said spacer means including at least a first aperture extending therethrough, said aperture being aligned with registered circuit portions on said circuit means whereby electrical contact between registered portions of said circuit pattern of said first circuit means and said circuit pattern of said second circuit means may be established through said spacer means aperture, said aperture cooperating with said circuit means to define a cavity between said first and said second circuit means, said spacer means having at least a first undulating surface adjacent to one of said circuit means, said undulating surface defining a gas flow passage which is in communication with said cavity defined by said aperture.

4,456,799

SWITCH CONSTRUCTION FOR TELEPHONE INSTRUMENT

Steve W. Haskins, Corinth, Miss., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,832
Int. Cl.³ H01H *21/02, 1/58;* H01R *9/12*
U.S. Cl. 200—5 R **8 Claims**



1. A switch mechanism comprising a first and a second identical leaf spring with one of said springs inverted relative to the other spring to place a contact making member of one spring in position to engage a like member on the other spring, an insulating housing for mounting said springs in said position, said housing including a base portion for gripping each spring in an intermediate mounting portion thereof, each said base portion including: an elongated channel for receiving the spring therein, an elongated trough in said channel for receiving an insulating wire in said trough adjacent said spring and parallel thereto, a socket transversely across said channel and trough and extending to a base of said socket further into said base portion than said channel and trough; each said spring including a cantilevered section within said mounting portion, said section including an insulation piercing segment adapted to fit into said socket, and means for compressing said segment to drive said piercing segment and into the wire and toward the base of said socket whereby to pierce the insulation of the wire and place said leaf spring in conductive contact with the conductor of a wire in said trough.

4,456,800

PLANAR CONTACT ARRAY SWITCH HAVING IMPROVED GROUND PATH FOR DISSIPATING ELECTROSTATIC DISCHARGES

John P. Holland, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed May 25, 1983, Ser. No. 498,046
Int. Cl.³ H01H *9/02, 13/04;* H05F *3/02*
U.S. Cl. 200—5 A **9 Claims**

1. An improved switch comprising:

a substrate having a first surface which embodies a perimeter ground path thereon and at least one switch contact path laterally spaced from said ground path;

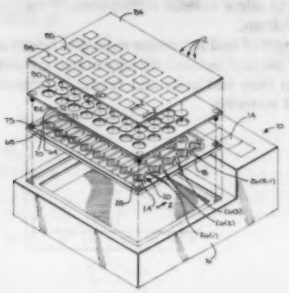
a conductive member overlying said switch contact path but only making electrical contact therewith to complete an electrical circuit therewith when said conductive member is urged against said switch contact path; and

at least one charge conductive path on said first surface of said substrate so as to extend from said ground path adjacent to said switch contact path for carrying any electrostatic discharge impacting said substrate adjacent to said switch contact path away from said switch contact path to said ground path.

5. The invention according to claim **1** wherein said substrate carries a plurality of switch contact paths arranged in a matrix array of C columns by R rows and wherein said substrate carries a plurality of charge conductive paths, each charge

conductive path extending from said ground plane between an adjacent pair of columns of said switch contact paths.

8. A printed circuit board having a metal clad surface which embodies a perimeter ground path foil thereon and at least one switch contact foil pair lying within the area bounded by said perimeter ground path foil wherein the improvement comprises;



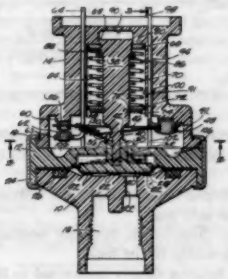
at least one charge conductive foil embodied on said metal clad substrate surface so as to extend from said ground path foil adjacent to said switch contact foil pair for carrying any electrostatic discharge impacting the printed circuit board adjacent to the switch contact foil pair away from the switch contact foil pair to the ground path foil.

4,456,801

PRESSURE SWITCH

Richard L. Lauritsen, Hoffman Estates, and David W. Kozerski, Cicero, both of Ill., assignors to The Singer Company, Stamford, Conn.

Filed Mar. 8, 1982, Ser. No. 355,630
Int. Cl.³ H01H *35/34*
U.S. Cl. 200—83 P **7 Claims**



1. In a pressure switch of the type having a housing in which a diaphragm is mounted for response to pressure in a chamber to move a switch actuator mounted in and guided by a recess in the housing, the improvement comprising;

a pair of springs mounted on the actuator, each spring being compressed between a seat fixed on the actuator and an associated separate seat slidably mounted on the actuator, an associated separate limit stop on the actuator for each of the slidable seats,

shoulder means in the recess engaged by one of the sliding seats so actuator movement is opposed by the force of said one spring,

said one seat being operative to be engaged by the other sliding seat at a given point in the actuator travel to prevent further movement of said other seat whereby continued travel of the actuator with increasing pressure is opposed by the combined force of both springs,

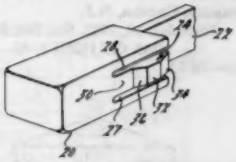
the switch being actuated from a first position to a second position after both springs have become operative to oppose the pressure in the chamber and the switch being actuated from the second position to the first position only after the seat associated with said other spring has reengaged its associated limit stop.

4,456,802

ANTI-RATTLE PUSHBUTTON ASSEMBLY

Donald M. Sutherland, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 11, 1983, Ser. No. 484,120
Int. Cl.³ H01H *3/12*
U.S. Cl. 200—340 **21 Claims**



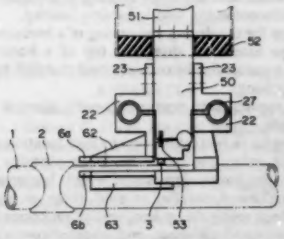
1. A pushbutton assembly with a plurality of depressible pushbuttons contiguously disposed for manual actuation, wherein each pushbutton contains a manual contacting end cap formed of sufficient dimensions to be depressible a predetermined distance by an operator's finger and wherein each contacting end cap contains means biased for contacting the next adjacent end cap of the next adjacent pushbutton and prevent rattle noise from occurring.

4,456,803

METHOD AND APPARATUS FOR MAKING AN ELECTRIC RESISTANCE WELDED TUBE

Fumio Kaneda, Hussa, and Tadahiro Maeike, Hachioji, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha and Nichiden Koshuha Kabushiki Kaisha, both of Tokyo, Japan

Continuation of Ser. No. 120,866, Feb. 12, 1980, abandoned. This application May 25, 1982, Ser. No. 381,782
Claims priority, application Japan, Feb. 26, 1979, 54-20733
Int. Cl.³ H05B *6/40*; B23K *31/06*
U.S. Cl. 219—8.5 **25 Claims**



1. A method of making a heavy wall welded tube from a generally tubular metal member having a pair of longitudinally directed edges of substantial thickness which are to be welded together, comprising:

flowing a high-frequency electric welding current in a Vee part formed by the longitudinally directed edges of the tube to be welded;

locating at least one conductor closely adjacent to and along

a surface of said Vee part of said tube to be welded, said at least one conductor being spaced from said tube;

supplying to said at least one conductor a high-frequency current whose phase is substantially the same as the phase of the high-frequency welding current flowing in said Vee part of said tube; and

controlling the distribution of current density in said Vee part of said tube to be welded by means of said at least one conductor to obtain a substantially uniform distribution of current density, and substantially uniform heating of said tubular metal member, in the thickness direction of said Vee part of said tube at least at the portions thereof which are being welded together.

4,456,804

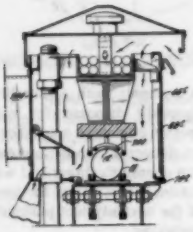
METHOD AND APPARATUS FOR APPLICATION OF PAINT TO METAL SUBSTRATES

Robert Lasky, Medford; Donald C. Lobach, Marlton, and Edward J. Bauer, Cherry Hill, all of N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed Jul. 13, 1982, Ser. No. 397,830

Int. Cl.³ H05B *6/40*

U.S. Cl. 219—10.43 **9 Claims**



1. The method of controlling the flow along a metallic substrate of a liquid coating containing a solvent and a solute, comprising:

induction heating said substrate selectively adjacent a marginal portion of said coating to establish in said body a temperature which is higher in a first part of said substrate just outside said marginal portion than it is in a second part of said substrate underlying said marginal portion of said coating, thereby to establish a negative temperature gradient extending from said first part of said substrate to said second part of said substrate;

maintaining said induction heating and said gradient until said coating has set sufficiently to prevent flow of said coating when said induction heating is discontinued; and thereafter discontinuing said induction heating.

6. Apparatus for the drying and curing of a horizontal initially-liquid stripe extending along the top of a horizontal can cylinder for a metal food container and parallel to the axis thereof, comprising:

means for moving said container axially along a predetermined path;

a linear-element induction heater at a first location along said path, said induction heater having a plurality of linear elements, the linear elements of which heater are operatively positioned parallel to said stripe as said object moves along said path, at least two of said linear elements being positioned adjacent, and circumferentially spaced from, the opposite edges of said stripe to concentrate the heat thereby induced in said container in bands extending on both sides of said stripes as said container moves along said path;

a serpentine induction heater operatively positioned at a second location above and along said path and spaced downstream from said linear element induction heater;

the length of said linear-element induction heater along said path and the heat induced thereby in said container at said first location being such that said paint is constrained against flowing downwardly along said container and forming ridges at the edges of said stripe, and such that upon the exiting of the container from said first location the stripe is set in position on said container;

a dwell station along the length of said path between said first and second locations which is free of induction heating, for allowing the temperature in said stripe to equalize and to allow volatile components of said paint to escape therefrom;

the length of said serpentine induction heater along said path and the heat induced thereby in said container being such as to cure said paint and render it substantially inert to food materials.

4,456,805

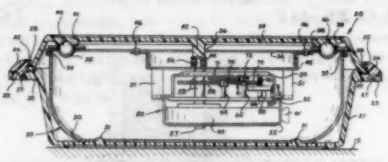
PORTABLE TURNTABLE FOR USE IN MICROWAVE OVENS

Jorgen A. Jorgensen, Bloomington, and Donald W. Nygren, St. Louis Park, both of Minn., assignors to Northland Aluminum Products, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 236,170, Feb. 20, 1981, which is a continuation of Ser. No. 927,928, Jul. 25, 1978, Pat. No. 4,258,630. This application Feb. 22, 1982, Ser. No. 351,336

Int. Cl.³ H05B *6/80*

U.S. Cl. 219—10.55 F **6 Claims**



1. In a portable turntable for use in microwave ovens to rotate a container containing a food product cooked within the oven,

(a) a pan shaped base having a flat bottom and an upright peripheral side wall,

(b) a cover disposed in covering position over the base rotably mounted to the base,

(c) a metal housing fixedly connected to the base,

(d) a wind-up spring motor having an output shaft enclosed within the housing and having a driving connection with the cover to rotate said cover, said base, cover and driving connection being formed of a dielectric material,

(e) a centrifugal governor,

(f) a gear train connecting the output shaft and the centrifugal governor so that the output shaft rotates more slowly than the centrifugal governor,

(g) said metal housing being relatively smooth and unencumbered with sharp edges throughout its entire exterior surface, and

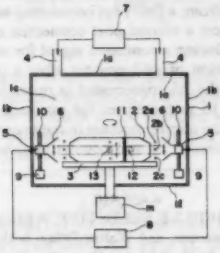
(h) an aperture in said metal housing of a size to receive said driving connection therethrough but sufficiently small to effectively eliminate microwave energy from the interior of said housing.

4,456,806

METHOD AND APPARATUS FOR THE HIGH FREQUENCY PREHEATING OF ELASTOMERIC PRODUCTS

Toshio Arimatsu, Akashi, Japan, assignor to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Jul. 28, 1982, Ser. No. 402,424
Claims priority, application Japan, Aug. 6, 1981, 56-123726
Int. Cl.³ H05B 6/68
U.S. Cl. 219—10.55 M 9 Claims



1. A method of preheating an elastomer product to a predetermined temperature which comprises the steps of:

placing in a lateral posture said elastomer product on a turntable rotatably provided within a preheating chamber for rotation by a drive means,

rotating said elastomer product,

intermittently applying high frequency irradiation toward an upper surface of said elastomer product, while said elastomer product is being rotated on said turntable, through a first waveguide means provided above said turntable and said elastomer product, coupled to a first high frequency oscillating means,

simultaneously, intermittently applying high freqeuncy irradiation onto a side portion of said elastomer product during said rotation thereof through a horn means positioned so as to be capable of being moved vertically or capable of being pivoted angularly in an upward and downward manner, said horn means being coupled through a second waveguide means to a second high frequency oscillating means for heat diffusion within said elastomer product, and

measuring the temperature in a radial direction and circumferential direction of said elastomer product during the interrupted periods of said intermittment high frequency irradiation irradiated from said waveguide means by a non-contact thermometer so as to monitor the temperature within said elastomer product such that said temperature is maintained uniform during said preheating, by varying said high frequency wave irradiation from either or both of said first and second waveguide means.

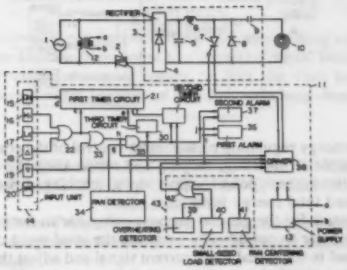
4,456,807

INDUCTION HEATING COOKING APPLIANCE

Yoshio Ogino, Nishinomiya; Takao Kobayashi, Hirakata; Yuji Tsuda, Hirakata, and Hitoshi Nishimura, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

PCT No. PCT/JP81/00413, 371 Date Sep. 9, 1982, 102(e) Date Sep. 9, 1982, PCT Pub. No. WO82/02466, PCT Pub. Date Jul. 22, 1982
PCT Filed Dec. 25, 1981, Ser. No. 422,973
Claims priority, application Japan, Jan. 13, 1981, 56-4810
Int. Cl.³ H05B 5/04
U.S. Cl. 219—10.77 4 Claims

1. An induction heating type cooking apparatus comprising: a power switch means which is responsive to a control signal; a frequency converter connected to a power source via said switch means; a heating coil which is excited; and a control means for controlling the operation of said frequency converter, said control means including a power on circuit, a pan detecting protective circuit, a fault protective circuit and a power off circuit; said power on circuit including at least three input devices for turning on a power supply, setting an output level and turning off said power supply, wherein said power switch means is supplied with an on signal for a given period of time in response to an output of a first timer circuit becoming operative due to an on input signal and at the same time said first timer circuit is prevented from timing in response to an output setting signal which is introduced within a predetermined period of time when said timer circuit is in operation, wherein a first visual alarm, a second audible alarm and a second timer circuit are rendered operative with the logic product of a pan absence signal from a pan detector included in said pan detecting protective circuit for sensing the presence or



absence of a pan to be heated and said output setting signal and the supplying of said power switch on signal to said power on circuit is interrupted by the output of said second timer circuit when said logic product lasts for a predetermined period of time when said second timer circuit is in operation, wherein said fault protective circuit operates said first and second alarms and said second timer circuit in response to a fault output from either of a small-sized load detector, an overheating protective circuit and a pan centering detector and said power switch means is prevented from being actuated when said fault output lasts for more than a time period which has been set in said timer circuit, and wherein said power off circuit inhibits the delivery of said output setting signal and the heating operation of said frequency converter and allows a third timer circuit to operate in response to said power off signal and the output of said power off circuit inhibits the operation of said power switch means.

4,456,808

MICROPROCESSOR CONTROL OF WELDING APPARATUS

Harold C. Wilkinson, Medford, N.J.; Charles E. Gum, North Wales, Pa.; Rodney C. Howe, Haddon Heights, N.J.; Dean P. Macinskas, Souderton, Pa.; Charles C. Pease; Robert J. Raycher, both of Vincentown, N.J.; Ronald Rosen, and Francis J. Williams, both of Chalfont, Pa., assignors to KSM Fastening Systems Inc., Moorestown, N.J.

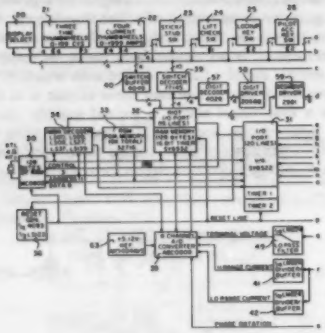
Continuation-in-part of Ser. No. 241,072, Mar. 6, 1981, abandoned. This application Mar. 5, 1982, Ser. No. 355,195
Int. Cl.³ B23K 9/20
U.S. Cl. 219—98 10 Claims

1. In apparatus for stud welding two metallic members by heating by an electric welding arc including a welding current power supply, holding means for holding one of the metallic members through which weld current is passed in creating the welding arc and weld current cable means interconnecting the current power supply and the holding means, the improvements for controlling welding current parameters comprising:

a general purpose digital computer;

programmable weld current reference means accessible by the computer into which the ideal weld current can be set and providing an ideal weld current reference signal;

weld current sensing means accessible by the computer providing an actual weld current signal proportional to the actual weld current;



total energy regulating means under control of the computer capable of initiating, varying and terminating the output of the current power supply upon reaching a predetermined total energy level; and

a program for the general purpose computer to instruct the computer to periodically compare the ideal weld current signal to the actual weld current signal and adjust the total energy regulating means to adjust the actual weld current to equal the ideal weld current.

4,456,809

MICROPROCESSOR-CONTROLLED CONTROLLER FOR RESISTANCE WELDING MACHINES

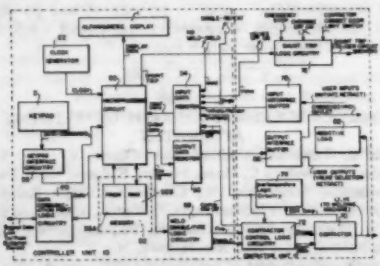
Gary A. Jones, Chatsworth, Calif.; David C. Bacon, Clawson, Mich., and Monte A. Pooley, Newbury Park, Calif., assignors to Pertron Controls Corporation, Canoga Park, Calif.

Filed Mar. 25, 1982, Ser. No. 361,820

The portion of the term of this patent subsequent to Nov. 17, 1998, has been disclaimed.

Int. Cl.³ B23K *11/24*

U.S. Cl. 219—108 **3 Claims**



1. A system energized by a source of line voltage for controlling resistance-type welding machine, or the like, comprising: a microprocessor for controlling weld operations of the welding machine; programmable read only memory means connected to said microprocessor and containing pre-programmed instructions for said microprocessor; random access memory means connected to said microprocessor containing pre-programmed weld schedules for the microprocessor; a manually operable key pad; interface circuitry connecting said key pad to said microprocessor to permit user data to be entered into said random access memory means to modify said pre-programmed weld schedules; an alphanumeric display system connected to said microprocessor for displaying operational data including data entered into said random access memory means by said key pad and existing weld programs stored in said random access memory means; contactor circuitry for controlling solid state switching devices connecting the source of line voltage to the welding machine; output circuitry connected to said microprocessor for supplying a fire control signal to said contactor circuitry; logic circuitry connected to said microprocessor including a clock pulse generator and an up/down counter connected to said generator for counting clock pulses therefrom; a first port connecting said counter to said microprocessor; a second port connected to said microprocessor for producing a command signal for said counter to reverse the operation of said counter after a predetermined count so long as the microprocessor is operational; and circuitry connected to said counter for producing a disabling control signal for the microprocessor in the event the predetermined count is exceeded by said counter in either direction.

4,456,810

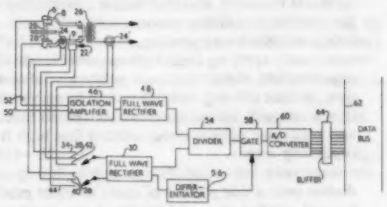
ADAPTIVE SCHEDULE SELECTIVE WELD CONTROL

Berthold W. Schumacher, and Walter Dilay, both of Dearborn, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Mar. 29, 1982, Ser. No. 362,802

Int. Cl.³ B23K *11/24*

U.S. Cl. 219—110 **12 Claims**



1. A method for welding a workpiece located between electrodes comprising:

supplying alternating welding current to the electrodes;

determining the time rate of rise of resistance across the electrodes during the first several cycles of welding current in which the resistance increases steadily that are supplied immediately following the first few cycles of welding current during which the resistance changes unstably and without a steady trend; and

increasing the magnitude of the welding current if the time rate of resistance rise is less than a preselected rate or reducing the magnitude of the welding current if the time rate of resistance rise is greater than a preselected rate.

4,456,811

METHOD OF AND APPARATUS FOR HEAT TREATING AXISYMMETRIC SURFACES WITH AN ANNULAR LASER BEAM

Richard A. Hella, North Andover, and John V. Staal, Needham, both of Mass., assignors to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Jun. 21, 1982, Ser. No. 390,176

Int. Cl.³ B23K *27/00*

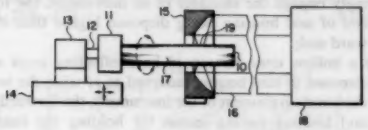
U.S. Cl. 219—121 LM **9 Claims**

1. The method of heat treating exposed metal surfaces comprising the steps of:

(a) providing a metal work piece having an axisymmetric exposed metal surface to be heat treated, said metal surface being concentric about an axis;

(b) providing an annular laser beam having sufficient energy to effect the desired heat treating;

(c) at least substantially circumferentially receiving and projecting said laser beam as a plurality of substantially separate annular segments on said metal surface concentric about said axis, said reflected segments being arrayed and directed with respect to each other toward said metal



surface to define at said metal surface a heat treating zone having a predetermined energy distribution in a direction normal to the direction of the reflected segments; and

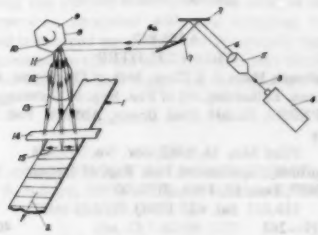
(d) causing rotational motion between said surface and said reflected segments.

4,456,812

LASER TREATMENT OF ELECTRICAL STEEL

Gary L. Neiheisel, Cincinnati, and Jerry W. Schoen, Hamilton, both of Ohio, assignors to Armco Inc., Middletown, Ohio

Filed Jul. 30, 1982, Ser. No. 403,714
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LM **26 Claims**



1. A process for improving the core loss of magnetic materials of the type having a plurality of magnetic domains and an insulative coating thereon chosen from the class consisting of a mill glass, an applied coating, and an applied coating over a mill glass, said process comprising the step of momentarily irradiating said magnetic materials having said insulative coating thereon with a continuous wave laser so as to subdivide said magnetic domains without damage to said insulative coating.

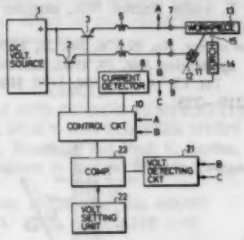
4,456,813

HOT WIRE TYPE ARC WELDING SYSTEM

Masanori Mizuno; Yoshiaki Kato, and Takaji Mizuno, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1982, Ser. No. 454,528
Claims priority, application Japan, Jan. 8, 1982, 57-1580
Int. Cl.³ B23K *9/10*
U.S. Cl. 219—130.21 **11 Claims**

1. A hot wire type arc welding system, comprising;
an electrode,
a filler wire fed between said electrode and a base metal,
a first switching element connected between said wire and a DC source, said first switching element being adapted to control a wire heating voltage,
a second switching element for controlling a welding current,
wire heating voltage control means for detecting a wire heating voltage and controlling the on-off operation of said first switching element,
a current detector for detecting said welding current,
arc current control means for controlling the on-off operation of said second switching element,
short-circuit detecting means for detecting a short-circuit between said electrode and said wire, and



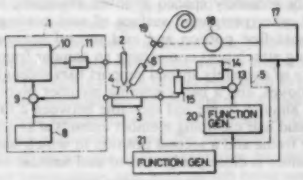
a protecting circuit for controlling said wire heating voltage control means in response to a detection signal from said short-circuit detecting means, to halt the wire heating voltage control function of said first switching element.

4,456,814

ARC WELDING APPARATUS INCLUDING FUNCTION GENERATORS FOR CONTROLLING WELDING PARAMETERS

Takaji Mizuno; Takao Shimizu, and Yoshiaki Kato, all of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 11, 1983, Ser. No. 457,316
Claims priority, application Japan, Jan. 11, 1982, 57-2530
Int. Cl.³ B23K *9/10*
U.S. Cl. 219—137.71 **2 Claims**



1. An arc welding apparatus, comprising:
an electrode,
an output current setting unit for producing an output current setting,
means responsive to said output current setting for controllingly supplying an output current to said electrode to create an arc between said electrode and a workpiece,
means for feeding a filler wire at a controllable feed rate into said arc to weld the workpiece,
a first function generator connected between said output current setting unit and said feeding means and responsive to said output current setting for issuing an output, which is a function of said output current setting, to said feeding means to control said feed rate,
means for applying a voltage to said filler wire with respect to the workpiece, and
a second function generator connected between said first function generator and said voltage applying means and responsive to said output from said first function generator for issuing an output, which is a function of said output from said first function generator, to said voltage means to control said voltage, whereby said output current, said feed rate of the filler wire, and said voltage applied to the

filler wire are adjusted in a mutually functional relationship solely by said output current setting unit.

4,456,815

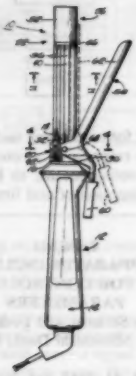
REMOVABLE HAIR GROOMING ATTACHMENT FOR A CURLING IRON

Matthew L. Andis, Racine, Wis., assignor to Andis Company, Racine, Wis.

Division of Ser. No. 59,676, Jul. 23, 1979, abandoned. This application Apr. 29, 1982, Ser. No. 372,986

Int. Cl.³ A45D *1/04, 1/18;* **H05B** *3/40*

U.S. Cl. 219—225 **3 Claims**



1. A hair curling iron comprising a handle, an elongated heating element having an outer peripheral surface and a first portion adjacent to said handle and a second portion spaced outwardly from said handle, means for defining a plurality of generally arcuately spaced grooves extending longitudinally on said outer peripheral surface of said heating element between said first portion and said second portion, and a hair grooming attachment comprising an annular frame including a plurality of arcuately spaced support bars slidingly engaged in said grooves, and a hair clamping member pivotally attached on said annular frame and movable between a first position in which said hair clamping member extends at an angle from said annular frame and a second position in which said hair clamping member is closely adjacent to said annular frame.

4,456,816

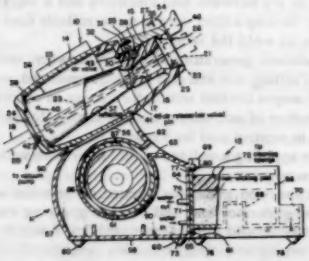
HOLDER FOR ELECTRICALLY HEATED INSTRUMENTS AND THE LIKE

William S. Fortune, 29866 Cuthbert St., Malibu, Calif. 90265

Filed Feb. 23, 1981, Ser. No. 237,220

Int. Cl.³ B23K *3/00;* **F16M** *11/00*

U.S. Cl. 219—242 **7 Claims**



1. A holder for an electronically temperature controlled electric soldering instrument of the character including a handle portion having an enlarged diameter shoulder about the periphery of its forward end and a working shaft extending axially forwardly therefrom and terminating in a heated tip element, said holder comprising:

(a) a hollow housing having a forward end adapted to sealingly engage the shoulder of an instrument, the forward end of said housing being disposed higher than its rearward end;

(b) a hollow cone having of heat-reflecting inner surface disposed in said housing adapted to receive the working shaft and tip element of the instrument, the forward end of said housing having means for holding the instrument downwardly and at an angle with respect to the central axis of said housing and cone;

(c) releasable locking means for retaining said shaft and tip element within said housing and being pivoted to the forward end of said housing and biased into its locked position, said releasable locking means having a forward portion for causing the shoulder of the instrument to push said releasable locking means into its unlocked position to permit entry of the instrument, and having a finger actuable portion for similarly unlocking said locking means and releasing the instrument when the instrument is held by the operator at its portion adjacent the shoulder thereof; and

(d) means disposed on top of said housing for securing thereto another tool.

4,456,817

CIGAR LIGHTER

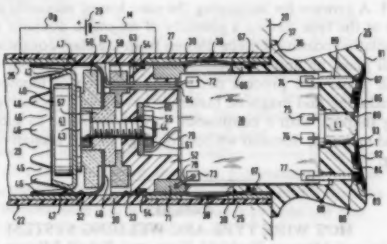
Walter Mehnert; Hans J. Köllner, both of Ottobrunn, and Helmut Tönnes, Eglharting, all of Fed. Rep. of Germany, assignors to PEBRA GmbH Paul Braun, Altbach, Fed. Rep. of Germany

Filed May 13, 1982, Ser. No. 377,688

Claims priority, application Fed. Rep. of Germany, May 22, 1981, 3120457; Dec. 17, 1981, 3150090

Int. Cl.³ F23Q *7/22*

U.S. Cl. 219—263 **40 Claims**

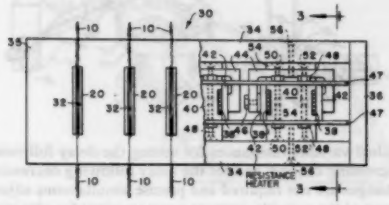


1. A cigar lighter for vehicles and the like comprising a cylindrical socket having a pair of terminals connected to a source of electrical current, and a lighter plug axially insertable into said socket, said plug comprising a cylindrical body having a heating element fixedly mounted at its front end, a knob fixedly mounted at its rear end, a pair of contact elements connectable on insertion of said plug within said socket with respective ones of said terminals and an electronic control circuit comprising an arrangement of a driver circuit adapted to connect said source of current with said heating element, a timing circuit connected to said driver circuit and operable to trigger said driver circuit for a predetermined period of time and thereafter to block said driver circuit for a second predetermined period of time, and switch means mounted on said knob for actuating said timing circuit.

4,456,818
YARN HEATER

John K. McCollough, and William M. Pascoe, Sr., both of Spartanburg, S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

Filed Aug. 26, 1981, Ser. No. 296,105
Int. Cl.³ D02G *3/34;* D01H *13/28;* F24H *3/08*
U.S. Cl. 219—373 4 Claims

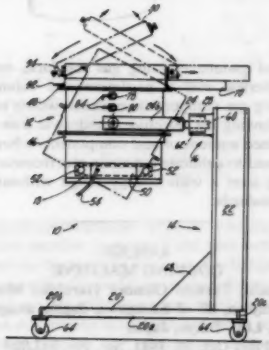


1. A fluid heater comprising: a heat conductive block, a first notch in said block on one side thereof, a second notch in said block on the opposite side thereof, a plurality of fluid conveying tubes located in each of said notches, an electrical resistance heater mounted adjacent the fluid conveying tubes on each side of said block in heat transfer relationship thereto, a U-shaped clamping member extending over said block and telescoping the electric heaters on both sides of said block, means operably associated with said clamping member to cause said telescoped members to be compacted together and means mounted on the top and bottom of said block and said heaters to maintain said block and said heaters in vertical alignment.

4,456,819
ADJUSTABLE WELDING FURNACE

Thomas B. Ballard, 25550 Mulberry, Southfield, Mich. 48034

Filed Oct. 21, 1981, Ser. No. 313,421
Int. Cl.³ A21B *1/22*
U.S. Cl. 219—391 6 Claims



1. A welding furnace, comprising:

a base;

means adapted for housing a workpiece to be welded and including an opening therein allowing access to said workpiece;

means for pivotally mounting said housing means on said base;

means carried by said housing for shiftably supporting said workpiece within the interior of said housing;

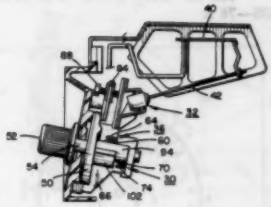
means communicating with said interior of said housing for heating said interior; and,

closure means shiftably mounted on said housing means for closing said opening in said housing, said closure means including a cover having a pair of spaced-apart opposing edges and hinge means along each of said edges for mounting said cover on said housing means for pivotal movement about either of two respectively associated spaced-apart reference axes.

4,456,820
ROTARY CAM AND SENSOR TEMPERATURE CONTROL FOR V-1000 TOASTER OVEN

Charles Z. Krasznai, Trumbull, and Paul V. Snyder, Oxford, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed May 2, 1983, Ser. No. 490,407
Int. Cl.³ F27D *11/02;* A21B *1/40*
U.S. Cl. 219—398 5 Claims



1. In an electric oven toaster including upper heating elements, lower heating elements, a thermostat switch which may be set to open when a particular preset temperature has been reached, a main switch for energizing and deenergizing the oven toaster including both its upper and lower heating elements, a solenoid operated upon opening of the thermostat switch to open the main switch to deenergize both the upper and lower heating elements, and a bake switch which is movable to an open position during a baking operation to prevent energization of the solenoid and the opening of the main switch when the threshold temperature that has been set by the thermostat is reached to thereby permit the thermostat switch to cycle on and off during the baking operation to maintain a particular bake temperature, said bake switch being moved to a closed position during the toast operation to permit the solenoid to open the main switch when the particular temperature set by the thermostat is reached during the toasting operation, the improvement comprising:

a. a manually operable rotatable cam for opening and closing the bake switch and for setting the threshold temperature of the thermostat switch during bake and toasting operations;

b. said bake switch including a fixed contact and a movable switch blade with a contact mounted thereon, said movable switch blade including a cam follower portion;

c. said rotatable cam including a rearwardly extending rod portion having a radially outwardly extending lobe for cooperating with the cam follower portion of the bake switch for opening the bake switch when a bake operation is set and closing the bake switch when a toast operation is set by manually adjusting the position of said rotatable cam;

d. said thermostat switch including a temperature sensor, a first movable switch blade with a contact mounted theron, said first movable switch blade being positioned for movement by said temperature sensor, a second movable switch blade with a contact mounted thereon, said second movable switch blade including a thermostat cam follower portion which may be adjusted to set the threshold tem-

perature at which said sensor may open said thermostat switch; and

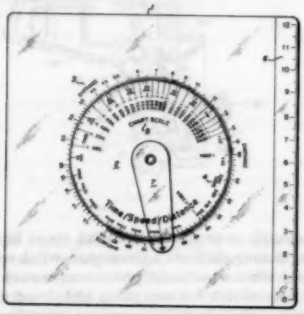
e. said rotatable cam including a circular disc portion integrally formed with said rod portion, said circular disc portion having a cam surface in sliding engagement with the thermostat cam follower portion of said second movable switch blade so that the rotary position of said rotatable cam may be manually adjusted to set the disc portion of said cam to set the thermostat cam follower for a particular toast color and simultaneously set the rod portion of said cam to close the bake switch so that the solenoid will be energized to open the main switch when the thermostat switch is opened at the toast temperature that has been set.

4,456,821

TIME/SPEED/DISTANCE SLIDE RULE

Burleigh W. Harter, 823 Canyon Rd., Redwood City, Calif. 94062

Filed Jun. 4, 1982, Ser. No. 385,070
Int. Cl.³ G01C *23/00*; G06C *1/00*
U.S. Cl. 235—78 R **7 Claims**



1. A time/speed/distance slide rule comprised of the following logarithmic scales: a fixed scale indicating distance traversed, a moving scale indicating elapsed time, and a moving scale indicating indicia of scale of chart or map in use, entries on said fixed scale juxtaposed to entries on said moving scale.

2. A time/speed/distance slide rule of claim 1 wherein there is: a base plate, a cooperating and rotating disc coaxially mounted on the base plate, a distance traversed scale printed on said base plate and juxtaposed to entries on said rotating disc, a time scale printed on said rotating disc and juxtaposed to entries on the fixed distance scale on said base plate, and a row of numbers constituting indicia of scale of chart or map printed on said rotating disc and juxtaposed to entries on said fixed distance scale printed on said base plate.

4,456,822

SELF-CONTAINED MULTI-MODE VIBRATORY FEEDER CONTROL WITH UNITARY DELAY ADJUSTMENT

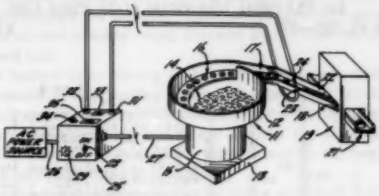
Robert F. Rose, and Lonnie W. Manning, both of Rockford, Ill., assignors to Dixon Automatic Tool, Inc., Rockford, Ill.

Filed Nov. 17, 1981, Ser. No. 322,281
Int. Cl.³ G01V *9/04*
U.S. Cl. 250—223 R **15 Claims**

1. A machine control for controlling the power fed to a machine in response to a sensor signal comprising,

machine power control means having an input receiving a control signal for controlling the power fed to the machine in response to the input control signal, and

signal delay means, having an input receiving the sensor signal and an output fed to the input of the machine power control means, for generating a control signal responsive to the sensor signal after an approximately equal delay following both increasing and decreasing changes in the sensor signal, and further having a variable resistor and control means responsive to the resistance of the variable resistor for adjusting the delay following both increasing and decreasing changes in the sensor signal, so that individual variable resistances for setting the delay following increasing changes and for the delay following decreasing changes are not required and precise simultaneous adjustment of the variable resistors is not required for obtaining approximately equal delay following both increasing changes and decreasing changes in the sensor signal.

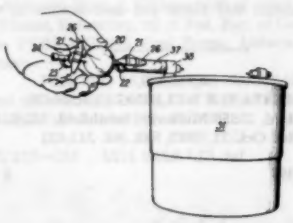


4,456,823

MIXED GAMMA EMITTING GAS STANDARD AND METHOD

Robert C. McFarland, and Patricia A. McFarland, both of 2393 Northside Pky., NW., Atlanta, Ga. 30327

Filed Nov. 18, 1981, Ser. No. 322,442
Int. Cl.³ G01D *18/00*; G12B *13/00*
U.S. Cl. 250—252.1 **20 Claims**



1. A mixed gamma emitting gas standard, comprising: a precision spherical vial of predetermined volume, multiple mixed emitting gas components enclosed within said vial, and means for allowing the selective withdrawal from said vial of a predetermined amount of said components wherein said gas standard is used to calibrate a gamma spectrometer system for gas counting over a wide energy range without the use of additional standards.

4,456,824

COPYING MACHINE

Yoshiki Kikuchi; Takashi Ohmori; Haruhiko Moriguchi, and Hisao Nakajima, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 16, 1981, Ser. No. 312,024
Claims priority, application Japan, Dec. 10, 1980, 55-174077
Int. Cl.³ G03C *5/16*
U.S. Cl. 250—318 **8 Claims**

1. A transfer-type thermosensitive copying machine, comprising:

a housing;

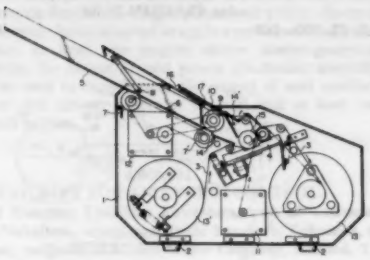
a paper supply guide disposed in an upper portion of said housing and extending obliquely into said housing;

an ink donor sheet supply in said housing;

a thermal head assembly;

a printing roller disposed in said housing adjacent the lower

end of said paper supply guide for receiving a sheet of paper from said supply guide and advancing said sheet of paper with a portion of an ink donor sheet in overlapping relation past said thermal head assembly, whereby said thermal head assembly selectively heats said paper



through said donor sheet to transfer an image to one side of said sheet of paper; and

a discharge tray disposed above said supply guide, said discharge tray receiving said sheet of paper with said one side facing upwardly after said image has been transferred.

4,456,825

METHOD OF AND DEVICE FOR CHARGING BY CORONA DISCHARGE

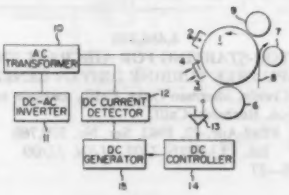
Tsukasa Kuge; Koichi Tanigawa, both of Tokyo, and Tsuyoshi Watanabe, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 174,835, Aug. 4, 1980, abandoned, which is a continuation of Ser. No. 1,204, Jan. 5, 1979, abandoned, and Ser. No. 798,040, May 18, 1977, abandoned. This application Aug. 26, 1982, Ser. No. 413,495

Claims priority, application Japan, May 26, 1976, 51-60778; Jul. 30, 1976, 51-91837; Jul. 30, 1976, 51-91838; Jul. 31, 1976, 51-91938; Oct. 18, 1976, 51-124544

Int. Cl.³ H01T *19/24*

U.S. Cl. 250—324 **13 Claims**



1. An electrophotographic process wherein a grounded photosensitive member is charged and then exposed to image light to form an electrostatic image, and wherein a developed image corresponding to the latent image is formed on a transfer material, said process utilizing a plurality of corona dischargers including an AC corona discharger provided adjacent to said photosensitive member for performing different functions during the process, wherein the AC corona discharger and an image-light exposing means for imparting potential changes to the photosensitive member are operated simultaneously, comprising the steps of:

applying electric power to said AC corona discharger from a power source means including a DC power source and an AC power source connected thereto in series;

detecting, at a location between an end of said power source means and ground, the current difference between the positive and the negative current components of the AC current which flows between said power source means and ground; and

controlling said DC power source in accordance with the detected current to maintain the current difference constant.

4,456,826

ROTATING DETECTOR SYSTEM WITH COOLANT SUPPLY

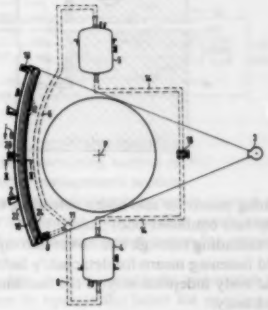
Helmut Forster, Neunkirchen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,868

Claims priority, application Fed. Rep. of Germany, Dec. 15, 1981, 3149705

Int. Cl.³ G01T *1/24*; G03B *41/16*

U.S. Cl. 250—370 **7 Claims**



1. In an arrangement for preparing a sectional image of the body, the picture elements of which are derived from the absorption of iodizing rays which penetrate the corresponding body element in a sectional body plane in different directions, with a rotating detector system which contains detectors arranged side by side in the plane of motion, the improvement comprising:

(a) the detector system containing individual detectors;

(b) a cooling system provided with a cooling finger against which cooling surfaces of said detectors rest;

(c) two coolant tanks which are arranged in the plane of motion of the detector system centrally symmetric to its center of rotation; and

(d) a cryogenic line connecting said tanks to said cooling system.

4,456,827

TRANSPORTATION AND/OR STORAGE CONTAINERS FOR RADIOACTIVE MATERIAL

Werner Botzem, Alzenau; Reiner Laug; Hartmut Kroll, both of Hanau; Elmar Schlich, Gründau; Walter Anspach, Hanau; Karl Brendel, Mühlheim, and Peter Srostlik, Maintal, all of Fed. Rep. of Germany, assignors to Transnuklear GmbH, Hanau, Fed. Rep. of Germany

Filed Jul. 10, 1981, Ser. No. 282,015

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 8018593[U]

Int. Cl.³ G21F *5/00*

U.S. Cl. 250—506.1 **2 Claims**

1. A transportation and/or storage container for radioactive substances, especially for irradiated fuel elements from nuclear reactors, comprising:

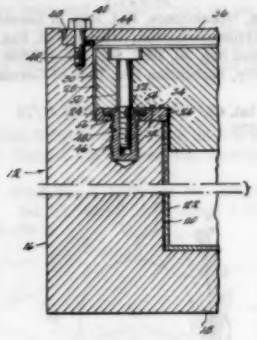
a thick-walled open-top closed-bottom metallic cylindrical body for shielding gamma radiation from radioactive substances carried therein, said body having a circular interior cavity and a counterbore in its top;

a detachable lining for said cavity of corrosion resistant

material, said lining having a top peripheral flange overlying the bottom of said counterbore;

a thick metallic cover for said lining disposed in said counterbore for shielding gamma radiation from radioactive substances carried in said lining;

sealing means interposed between the opposed surfaces of said flange and said lining cover inwardly of the periphery of said flange;



fastening means for said lining extending through said flange into said container body; and

bolts extending through said cover into tapped sockets inside said fastening means for detachably fastening said cover to said body independently of the fastening of said lining to said body.

4,456,828

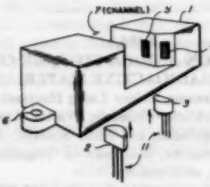
OPTOELECTRONIC COUPLER HOUSING

Daniel W. Mason, Scottsdale, and David W. Stevenson, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Oct. 15, 1979, Ser. No. 84,967

Int. Cl.³ G02B *27/00*

U.S. Cl. 250—551 **2 Claims**



1. A housing for at least a pair of separately-packaged optoelectronic devices including an optical emitter and an optical sensor comprising:

a body containing receptor cavities for holding said emitter and said sensor in predetermined positions and providing at least two optical paths between said emitter and said sensor devices;

a first of said optical paths optically coupling said emitter and said sensor directly and a second of said optical paths being indirect and incomplete without reflective means external to said housing.

4,456,829

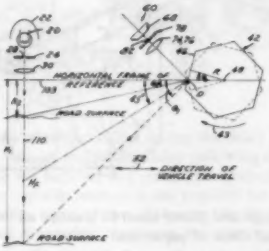
NON-CONTACT SENSOR, SYSTEM AND METHOD WITH PARTICULAR UTILITY FOR MEASUREMENT OF ROAD PROFILE

Donald R. Fobey, Plymouth, Mich., assignor to K. J. Law Engineers, Inc., Farmington Hills, Mich.

Filed Oct. 29, 1981, Ser. No. 316,350

Int. Cl.³ G01N *21/86*

U.S. Cl. 250—560 **18 Claims**



1. Apparatus for measuring distance to a surface comprising first means for directing a light beam onto a surface to illuminate a portion of the surface; optical scanner means comprising means rotatable about an axis and a plurality of reflective facets mounted in a circumferential array about the periphery of said rotatable means, said scanner means being disposed to receive light from said first means reflected by the surface; first light responsive means mounted in fixed position with respect to said axis to receive optical images of the illuminated portion of the surface successively reflected thereon by said facets in turn for providing a surface image signal in response to incidence thereon of each said optical image; second means including reference light source means for directing light energy onto each said facet in turn as said scanner means rotates, and reference detection means disposed to receive light energy from said reference light source means reflected in turn by each said facet for providing a reference signal; and third means responsive to a temporal relationship between said image signal and said reference signal for measuring distance to the surface.

4,456,830

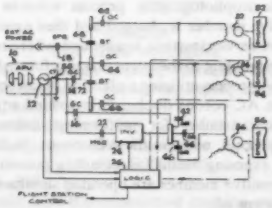
AC MOTOR-STARTING FOR AIRCRAFT ENGINES USING APU FREE TURBINE DRIVEN GENERATORS

Michael J. Cronin, Sherman Oaks, Calif., assignor to Lockheed Corporation, Burbank, Calif.

Filed Apr. 22, 1982, Ser. No. 370,760

Int. Cl.³ F02N *7/08, 11/04, 17/00*

U.S. Cl. 290—27 **18 Claims**



1. An aircraft ac motor starting system for starting at least one aircraft engine comprising:

a free turbine auxiliary power unit;

a generator arranged to be driven by said auxiliary power unit;

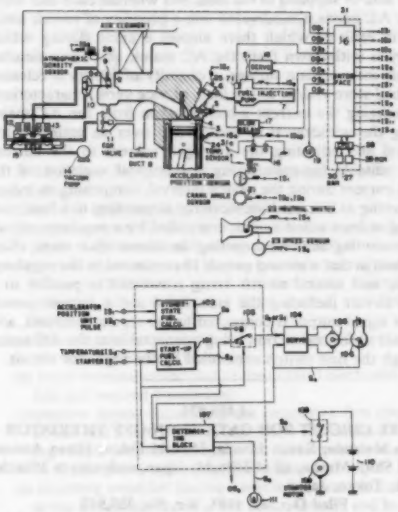
at least one engine driven starter-generator arranged to be driven by each of said at least one aircraft engine, said at least one engine driven starter-generator being electrically interfaced with said auxiliary power unit driven generator; and

a power electronics assembly electrically interfaced with said auxiliary power unit driven generator and said at least one engine driven starter-generator, said power electronics assembly being adapted to apply a power characteristic to said at least one engine driven starter-generator whereby the output of said power electronics assembly can be used to complement the output of said auxiliary power unit driven generator to start said at least one aircraft engine.

4,456,831
FAILSAFE FOR AN ENGINE CONTROL

Hidetoshi Kanegae; Yoshihisa Kawamura, both of Yokosuka; Masao Nakajima, Atsugi, and Seishi Yasuhara, Yokosuka, all of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 13, 1982, Ser. No. 339,153
Int. Cl.³ F02D *11/10*; F02B *77/00*
U.S. Cl. 290—38 R 11 Claims



1. A failsafe system for an engine control system which produces a command signal for controlling a controllable device of said engine, said failsafe system comprising:

(a) means for producing a feedback signal indicative of the state of said controllable device;

(b) a controller responsive to the command signal and the feedback signal to control said controllable device so that a difference between said command signal and said feedback signal is within a predetermined range;

(c) a starter motor switch operable for generating a start motor signal for normally operating an engine starter motor;

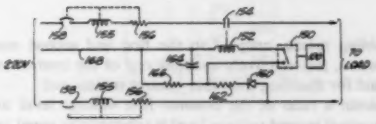
(d) a sensor for generating a sensor signal indicative of a sensed vehicle parameter and means responsive to the start motor signal and the sensor signal for adjusting said command signal to a value corresponding to optimal engine start-up conditions; and

(e) means, responsive to the start motor signal, the feedback signal, and the command signal, for preventing operation of the starter motor when the difference between said command signal and said feedback signal is outside of said predetermined range.

4,456,832
CIRCUIT BREAKER CONTROL DEVICE

Richard H. Greer, Temple City, and James B. Newport, Santa Ana, both of Calif., assignors to Southern California Edison Company, Rosemead, Calif.

Continuation-in-part of Ser. No. 1,707, Jan. 8, 1979, which is a continuation-in-part of Ser. No. 826,073, Aug. 19, 1977, abandoned. This application Aug. 14, 1980, Ser. No. 178,183
Int. Cl.³ H02J *13/00*
U.S. Cl. 307—38 12 Claims



1. Load management apparatus including

a manually operable switching section and

a remotely operable management section;

said switching section including interrupter contact means,

a manually operable spring powered first mechanism connected to said interrupter contact means for opening and closing thereof,

fault responsive trip means operatively connected to said first mechanism to operate the latter for opening of said interrupter contact means upon the occurrence of predetermined fault currents at said switching section;

said management section including

mechanical main contact means connected in series circuit with said interrupter contact means and an electrical load energized through said apparatus,

biasing means normally maintaining said main contact means closed,

remotely controlled electrically powered operator means operatively connected to said main contact means for selectively operating the latter to open said main contact means;

said switching section and said management section constituting first and second modules respectively;

said first and second modules including respective first and second housings of substantially equal widths stacked side by side.

4,456,833
REGULATED POWER SUPPLY

Stefan Traub, Boblingen, and Frank Rochlitzer, Altdorf, both of Fed. Rep. of Germany, assignors to Hewlett-Packard GmbH, Boeblingen, Fed. Rep. of Germany

Filed Nov. 2, 1982, Ser. No. 438,442
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1981, 3144696
Int. Cl.³ H02J *1/00*
U.S. Cl. 307—80 20 Claims

1. A power supply for supplying a predetermined regulated voltage at a load, said power supply comprising:

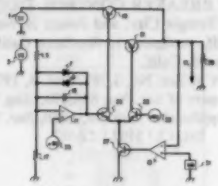
a first input for receiving a first voltage which varies between first maximum and minimum voltage levels around a first nominal voltage level;

a second input for receiving a second voltage which varies between second maximum and minimum voltage levels around a second nominal voltage level;

first control means, coupled between the first input and the load, for receiving the first voltage and for presenting a

third voltage at the load, the third voltage being substantially equal to the predetermined regulated voltage;

second control means, coupled between the second input and the load, for receiving the second voltage and for presenting a fourth voltage at the load, the fourth voltage being substantially equal to the predetermined regulated voltage;



enabling means, coupled to the first and second control means, for selectively enabling one of the control means and for disabling the other control means; and

wherein a ratio of the nominal first voltage level to the nominal second voltage level is substantially equal to one half of a ratio of the maximum first voltage level to the minimum second voltage level.

4,456,834

PROXIMITY SWITCH

Geoffrey J. Harris, Swindon, England, assignor to Square D Company, Palatine, Ill.

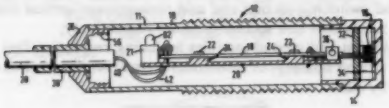
PCT No. PCT/GB81/00226, 371 Date Jun. 25, 1982, 102(e) Date Jun. 25, 1982, PCT Pub. No. WO82/01630, PCT Pub. Date May 13, 1982

PCT Filed Oct. 16, 1981, Ser. No. 395,066

Claims priority, application United Kingdom, Oct. 29, 1980, 8034829

Int. Cl.³ H01H *47/02, 35/00*

U.S. Cl. 307—91 **7 Claims**



1. A proximity switch comprising:

a metal cylindrical housing having a pair of ends,

a non-metallic end cap positioned in one of the ends,

a metallic closure positioned at the other end of the housing,

an induction coil positioned within a cavity in the cap and secured therein by a potting compound, circuitry including micro-miniature components connected in circuit with the coil and mounted on a substrate,

a plate-like carrier positioned in the housing and providing a mounting for the substrate,

a pin and socket pivotal hinged connection between the cap and the carrier for maintaining a connection between the carrier and the cap when the carrier and cap are positioned in the housing, and

means including a capacitor coupling a low potential side of the circuitry to the housing and an electrically conductive adhesive tape secured to the substrate and trapped between the housing and the closure to suppress the propagation of electric noise on the housing.

4,456,835

METHOD OF OPERATING A LOAD FROM ALTERNATING CURRENT MAINS AND CIRCUIT ARRANGEMENT THEREFOR

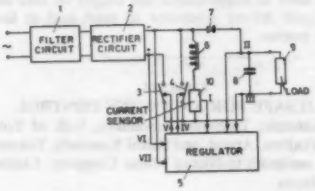
Heinrich Pichler, Sailerröckergasse 38, and Hermann Dum, Bockkellergasse 8/2/8, both of 1190 Wien, Österreich, Austria

Filed Dec. 8, 1981, Ser. No. 328,508

Claims priority, application Austria, Dec. 15, 1980, 6100/80

Int. Cl.³ H02J *1/02*

U.S. Cl. 307—107 **12 Claims**



1. Circuit arrangement for operating a load from alternating current mains, wherein a quantity of energy is withdrawn from the AC mains in single short switch intervals, is stored temporarily and/or supplied to the load, and wherein each half wave in the AC mains is subdivided into a plurality of switch intervals, in each of which there elapses a cycle during which energy is withdrawn from the AC mains, and using simultaneously intermediate storage, a quantity of energy is released to a final store and/or to the load, or vice versa, characterized in averaging the current which is taken from the AC mains during the withdrawal of energy and over an entire switch interval and adjusting the averaged current to the current value suitable for maintaining a sinusoidal variation of the mains current during the switch interval, comprising an inductor serving as intermediate store for connection to a load, and having at least a first switch controlled by a regulator circuit for connecting and disconnecting the intermediate store, characterized in that a second switch **15** connected to the regulator circuit, said second switch being connected in parallel to a series circuit including the inductor **6** and a current sensor whose signal output is connected to the regulator circuit, and that said series connection being connectable to the AC mains through the first switch controlled by the regulator circuit.

4,456,836

GATE CIRCUIT FOR GATE TURN-OFF THYRISTOR

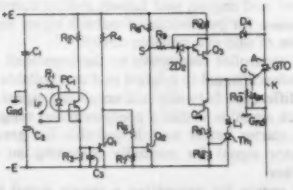
Yasuo Matsuda; Kazuo Honda; Hiroshi Fukui; Hisao Amano, and Shuji Musha, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 29, 1981, Ser. No. 335,547

Claims priority, application Japan, Dec. 29, 1980, 55-188646

Int. Cl.³ H03K *17/72*

U.S. Cl. 307—252 C **15 Claims**



1. A gate circuit provided with a turn-on circuit and a turn-off circuit each connected between gate and cathode terminals of a gate turn-off thyristor, said turn-on circuit including a series combination of a turn-on power source and a first NPN transistor, said turn-off circuit including a series combination

of a turn-off power source and a thyristor, said gate circuit comprising:

a signal input terminal connected to a base terminal of said first NPN transistor for supplying a control signal to said base terminal of said first NPN transistor; and

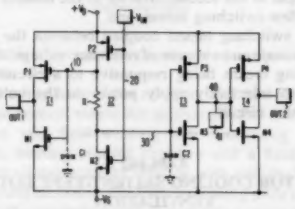
a PNP transistor connected between anode and gate terminals of said thyristor, emitter and collector terminals of said PNP transistor being connected to said anode and gate terminals of said thyristor, respectively, a base terminal of said PNP transistor being connected to said base terminal of said first NPN transistor.

4,456,837

CIRCUITRY FOR GENERATING NON-OVERLAPPING PULSE TRAINS

Otto H. Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 15, 1981, Ser. No. 311,512
Int. Cl.³ H03K *5/00, 5/01, 5/156*
U.S. Cl. 307—262 **7 Claims**



1. Circuitry for generating non-overlapping pulse trains, consisting of:

means for applying supply potential;

first and second transistors of complementary conductivity types, each transistor having respective first, second and control electrodes, and having principle conduction paths between their first and second electrodes controlled by potential applied between their control and first electrodes;

resistive means connected between the second electrodes of the first and second transistors;

an input terminal connected to the control electrodes of said first and second transistors;

respective means connecting the respective first electrodes of the first and second transistors to the means for applying supply potential to condition the respective transistors to conduct and operate as amplifiers;

an inverting amplifier having a sole input terminal connected at the second electrode of the first transistor and having an output terminal at which a first output signal is available; and

a noninverting amplifier having a sole input terminal connected at the second electrode of the second transistor, having an output terminal at which a second output signal is available, and wherein a large signal oscillatory signal applied to the input terminal produces first and second output signals that are antiphase with no pulse overlap.

4,456,838

LEVEL SHIFTING CIRCUIT

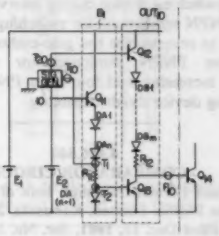
Shinichiro Taguchi; Nobuya Nagao, and Yutaka Ogihara, all of Fukaya, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 25, 1981, Ser. No. 238,025
Int. Cl.³ H03K *5/08*
U.S. Cl. 307—264 **4 Claims**

1. A level shift circuit comprising:

a first transistor having a base terminal, a collector terminal and an emitter terminal, said base terminal being biased at a first DC level and being coupled to a signal source circuit, said collector terminal being biased at a second DC level and said emitter terminal being connected to a first current branch;

a second transistor having base, collector and emitter terminals, said collector terminal of said second transistor being connected to said second DC level, said base terminal being connected to the first DC level and said emitter terminal being connected to a second current branch;



a current mirror connected between said first and second current branches, whereby substantially equal current flows therethrough; and

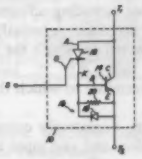
an output terminal connected to said first branch for delivering an AC signal therefrom and wherein each of said first and second current branches include a series of diodes and a resistor.

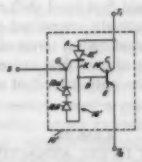
4,456,839

HIGH GAIN LATCHING DARLINGTON TRANSISTOR

Robert L. Steigerwald, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 25,383, Mar. 30, 1979, Pat. No. 4,295,059.
This application Mar. 11, 1981, Ser. No. 242,761
Int. Cl.³ H03K *17/10, 17/60, 17/72*
U.S. Cl. 307—315 **2 Claims**





1. A high gain latching Darlington transistor having increased dv/dt capability comprising:

(a) a four-layer PNPN semiconductor switching device having a gate, cathode, and anode electrode, said four-layer PNPN semiconductor switching device conducting current through the anode-cathode portion thereof in accordance with the polarity of gating pulse signals applied to said gate electrode;

(b) a load transistor having a base, collector, and emitter electrode, said load transistor coupled in Darlington con-

figuration to said four-layer PNPN semiconductor switching device, said load transistor conducting substantial load current through the collector-emitter portion thereof in response to current conduction through said four-layer PNPN semiconductor switching device; and

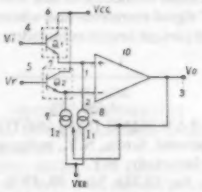
(c) circuit means comprising the parallel combination of a diode and a resistor coupled to said load transistor and said four-layer PNPN semiconductor switching device, said diode poled for providing a low loss path for conducting a portion of the transistor current through the cathode-gate junction of said four-layer PNPN semiconductor switching device during intervals when said four-layer PNPN semiconductor switching device is nonconductive to reverse-bias the gate-cathode junction of said four-layer PNPN semiconductor switching device, thereby increasing said four-layer PNPN semiconductor switching device dv/dt capability.

4,456,840

COMPARATOR CIRCUIT

Tetsuo Ide, and Hiromu Iwamoto, both of Yokohama, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Dec. 11, 1981, Ser. No. 329,947
Claims priority, application Japan, Dec. 26, 1980, 55-188936
Int. Cl.³ H03K *5/22*
U.S. Cl. 307—362 **8 Claims**



1. A comparator circuit operatively connected to receive input and reference voltages, comprising:

a differential amplifier including an input terminal, a reference terminal and an output terminal;

an input voltage terminal to which the input voltage is applied;

a reference voltage terminal to which the reference voltage is applied;

first level shift means, operatively connected between said input voltage terminal and said input terminal, for shifting the level of the input voltage;

first current source means, operatively connected to said first level shift means, for supplying current having a first current value to said first level shift means; and

control means, operatively connected to said first current source means and said output terminal, for controlling the first current value of said first current source means in accordance with the output level of said output terminal.

4,456,841

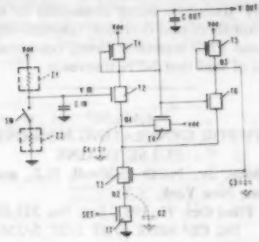
FIELD EFFECT LEVEL SENSITIVE CIRCUIT

Chung H. Lam, Williston, and Charles W. Peterson, Jr., Essex Junction, both of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 5, 1982, Ser. No. 346,431
Int. Cl.³ H03K *3/023, 3/353;* G01R *19/165;* G11C *7/06*
U.S. Cl. 307—530 **8 Claims**

1. A voltage level responsive circuit including first and second inverter circuits, each coupled between a voltage source and a common voltage node, each inverter including an input responsive device and a first impedance means, the input of the first inverter being responsive to an input signal and the output of the first inverter being coupled to the input of the second inverter, characterized by

a first switching means having a control electrode and two current conducting electrodes, the current conducting electrodes being coupled between the common voltage node and a reference voltage node, and means coupling



the output of the second inverter to the control electrode of the first switching means; and

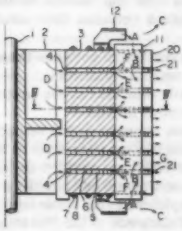
a second switching means coupled between the reference voltage node and a source of reference voltage, the second switching means being responsive to a circuit enabling signal to selectively apply power to the voltage level responsive circuit.

4,456,842

DEVICE FOR COOLING SALIENT-TYPE ROTOR BY VENTILATION

Kouji Tachibana, Kobe, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 2, 1982, Ser. No. 384,174
Claims priority, application Japan, Jun. 9, 1981, 56-85734[U]
Int. Cl.³ H02K *1/32*
U.S. Cl. 310—61 **3 Claims**



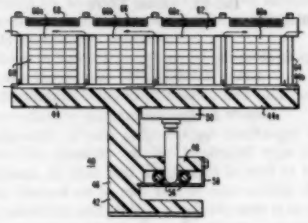
1. A device for cooling a salient-type rotor by ventilation, comprising a rim which serves as a yoke of the rotor and which has first radially extending ventilation ducts for carrying cooling air therethrough, and a plurality of spaced magnetic cores which are provided with field coils, said magnetic cores being mounted on the periphery of said rim such that spaces are defined between adjacent ones of said magnetic cores externally of said field coils, said magnetic cores having second ventilation ducts on both sides thereof relative to the circumferential direction of said rim between the outer peripheries of said magnetic cores and the inner peripheries of said field coils opening radially at the radially outermost end of said field coils, said first ventilation ducts communicating in the radial direction of said rim with said second vantilation ducts and with said spaces, wherein the cooling air which flows through said first ventilation ducts also flows entirely through said second ventilation ducts and through said spaces in parallel with said second ventilation ducts, such that said field coils are cooled from the outer side and from the inner side thereof.

4,456,843

BRUSHLESS DYNAMOELECTRIC MACHINE WITH IMPROVED CONTROL WHEEL ASSEMBLY

Carl J. Heyne, Hampton Township, Allegheny County, and Donald T. Hackworth, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 31, 1983, Ser. No. 499,625
Int. Cl.³ H02K *11/00*
U.S. Cl. 310—68 D 17 Claims



1. A brushless dynamoelectric machine comprising:
a rotatable shaft;
a field winding located for rotation with said shaft;
excitation control means for applying direct current excitation to said field winding and comprising a rectifier bridge, starting control circuitry and a field discharge resistor all mounted for rotation with said shaft on a control wheel including a radially extending plate portion and an axially extending rim portion of an outer end of said plate portion, said plate and rim portions of said control wheel being of a unitary mass of molded insulating material;
a plurality of elements of said rectifier bridge and said starting control circuitry arranged on an inner surface of said rim portion;
said field discharge resistor comprising a plurality of conductive winding turns on an outer surface of said rim portion; and means for radially compressively clamping said field discharge resistor to said rim portion.

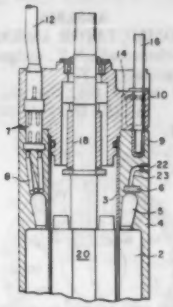
4,456,844

SUBMERGIBLE MOTOR CONSTRUCTION

Sakuei Yamamoto, and Mitsuhiro Nishida, both of Fukuoka, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 336,702, Jan. 4, 1982, abandoned. This application Oct. 27, 1983, Ser. No. 545,610
Claims priority, application Japan, Jan. 17, 1981, 56-6625; Jan. 17, 1981, 56-6626; Jan. 17, 1981, 56-6627
Int. Cl.³ H02K *5/10*
U.S. Cl. 310—87 3 Claims

1. In a mold type motor comprising a molded resin frame covering the surfaces of a stator iron core and a coil end and molded resin brackets detachably fitted on the end openings of said molded resin frame, an improvement which comprises a surge absorber unit including a pair of surge absorber members each constructed of a plural layer of voltage dependent resistor elements, wherein said surge absorber unit is embedded in said



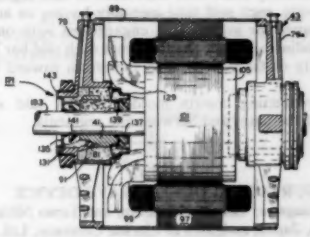
molded resin frame with an electrical connection to a ground terminal embedded in said molded resin frame.

4,456,845

DYNAMOELECTRIC MACHINE, BEARING DEVICES, WICK AND BEARING ASSEMBLIES

Eldon R. Cunningham, Fort Wayne, Ind., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 294,748, Aug. 20, 1981, Pat. No. 4,409,714.
This application Apr. 4, 1983, Ser. No. 482,112
Int. Cl.³ H02K *5/16;* F16C *33/66*
U.S. Cl. 310—90 44 Claims



25. A dynamoelectric machine adapted for energization across a power source comprising:
a structural component including a partial spherical seating surface thereon;
a rotatable assembly adapted for rotation in the dynamoelectric machine upon the energization thereof;
a bearing device for journaling a part of said rotatable assembly and including a peripheral portion having a partial toroidal seating surface extending thereabout and disposed in seating engagement within said partial spherical seating surface on said structural component, and a generally annular thrust surface on said bearing device extending generally radially with respect to said rotatable assembly part; and
means conjointly rotatable with said rotatable assembly for transferring axially directed thrust of said rotatable assembly occasioned upon the rotation thereof onto said structural member through the seating engagement of said partial spherical seating surface thereof with said partial toroidal seating surface on said bearing device, said transferring means including means for engagement with said thrust surface on said bearing device effecting the transfer thereto of the axially directed thrust occasioned upon the rotation of said rotatable assembly, means secured to said rotatable assembly for locating said engagement means with respect to said thrust surface of said bearing device, and means on said

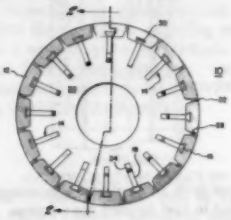
engagement means and said locating means for releasable connection therebetween, respectively.

4,456,846

COMMUTATOR ASSEMBLY

Vijay K. Stokes, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 29, 1982, Ser. No. 454,129
Int. Cl.³ H02K *13/00*
U.S. Cl. 310—233 **3 Claims**



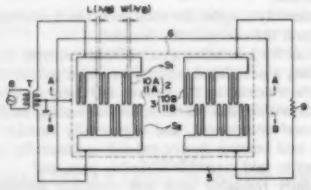
1. A commutator for rotating electrical machinery, comprising:
- a plurality of conductive segments having inner and outer surfaces, said segments being circumferentially arranged in a spaced-apart relationship about an axis so that their outer surfaces form an overall structure of cylindrical shape as the outer surface of the commutator, each of said segments having a longitudinal channel therein opening on its inner surface;
- a tang assembly associated with each of said segments, respectively, each said tang assembly having an anchoring bar shaped for interlocking engagement with one of the longitudinal segment channels, and each said bar having a plurality of tangs depending therefrom toward the axis; and
- a non-conducting matrix molded within said structure around the tangs and between the segments.

4,456,847

SURFACE ACOUSTIC WAVE DEVICE

Shoichi Minagawa; Takeshi Okamoto, and Teruo Niitsuma, all of Tokyo, Japan, assignors to Clarion Company, Ltd., Tokyo, Japan

Filed Jun. 1, 1983, Ser. No. 499,930
Claims priority, application Japan, Jun. 7, 1982, 57-96176
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—313 R **11 Claims**



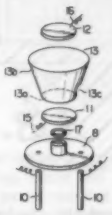
1. A surface acoustic wave device which comprises:
- an elastic substrate;
- a lower electrode means provided on said substrate;
- a piezoelectric film deposited so as to cover said lower electrode means; and
- an upper electrode means comprising first and second comb-shaped double electrodes provided on said piezoelectric film and opposed to said lower electrode means, said first and second comb-shaped double electrodes being opposed to and not interdigitating with each other, said double electrodes each having a plurality of split electrode fingers.

4,456,848

ULTRASONIC TRANSMITTING AND RECEIVING DEVICE

Eturo Yasuda; Shigeyuki Akita, and Masao Kodera, all of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 12, 1982, Ser. No. 357,617
Claims priority, application Japan, Mar. 16, 1981, 56-37429
Int. Cl.³ H04R *17/10*
U.S. Cl. 310—322 **4 Claims**



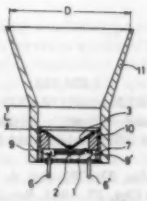
1. An ultrasonic transmitting and receiving device comprising:
- a plurality of terminals for receiving and delivering electric signals;
- a bimorph vibrator including two piezoelectric elements each connected electrically to a corresponding one of said terminals; and
- a metallic member made of a thin metal plate and including a flat plate portion placed between said piezoelectric elements and a cylindrical portion extending from a circumferential periphery of said flat plate portion.

4,456,849

PIEZOELECTRIC ULTRASONIC TRANSDUCER WITH DAMPED SUSPENSION

Ryoichi Takayama, Suita; Akira Tokushima, Kyoto; Nozomu Ueshiba, Neyagawa, and Yukihiko Ise, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Sep. 16, 1982, Ser. No. 418,839
Claims priority, application Japan, Sep. 22, 1981, 56-150288
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—324 **13 Claims**



1. An ultrasonic transducer for transmitting and receiving ultrasonic waves comprising:
- a piezo-electric laminated type ceramic element,
- a diaphragm composed of metal, connected at its substantial center to the substantial center of said piezo-electric element for ultrasonic transmission in air and ultrasonic reception from air,
- a connection pin for attaching said element to said dia-

phragm, said piezo-electric element being mechanically supported solely by said connection pin,

a housing for containing said piezo-electric element and said diaphragm therein,

a horn provided integral with said housing and having a throat part of a cylindrical inside space wherein said piezo-electric element and said diaphragm are disposed,

a tubular shaped buffer means fixed to an inner wall of said housing for holding the peripheral part of said diaphragm and for damping the mechanical vibrations of said diaphragm, said buffer means bonded to an inside wall of said housing by an electrically conductive adhesive, and said diaphragm bonded to said buffer member by an electrically conductive adhesive,

said horn defining a horn part of parabola shape extending from a throat part of cylindrical space,

said diaphragm being cone shaped and said laminated type piezo-electric element being disk shaped,

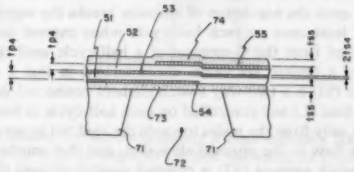
the diameter of said cone shaped diaphragm being larger than the diameter of said laminated type piezo-electric element, so that said diaphragm is held at its peripheral part thereof on an end face of said tubular shaped buffer means while said piezo-electric element is disposed in said tubular shaped buffer means with its peripheral part free from the inside wall of said tubular shaped buffer means.

4,456,850

PIEZOELECTRIC COMPOSITE THIN FILM RESONATOR

Takeshi Inoue, and Yoichi Miyasaka, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 9, 1983, Ser. No. 465,316
Claims priority, application Japan, Feb. 9, 1982, 57-19105
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—324 **20 Claims**



1. A piezoelectric thin film resonator comprising a first thin film formed of a semiconductor or an insulator material, a lower electrode formed on said first thin film, a piezoelectric thin film formed on said lower electrode, a second thin film formed of a material having an opposite resonant frequency temperature coefficient as compared to the corresponding coefficients of said piezoelectric thin film and positioned on said piezoelectric thin film, another piezoelectric thin film formed on said second thin film, and an upper electrode formed on said other piezoelectric thin film, the total thickness of the two piezoelectric thin films and said second thin film being within the range of 50 μm to 3 μm and the ratio of the thickness of said second thin film to the thickness of said two piezoelectric thin films being in the range of 0.085 to 0.093.

4,456,851

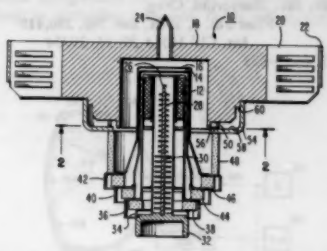
ELECTRON TUBE HAVING A LOW IMPEDANCE REDUCED STRESS ANODE STRUCTURE

Joseph R. Tomcavage, Lancaster, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 29, 1982, Ser. No. 363,298
Int. Cl.³ H01J *1/88, 19/42*
U.S. Cl. 313—250 **7 Claims**

1. In an electron tube comprising an evacuated envelope including an anode forming a section of said envelope, and a plurality of alternately-disposed annular metallic and insulating members, the improvement wherein said anode comprises

an anode ring having stress reduction means formed therein, said anode ring being attached to one of said metallic



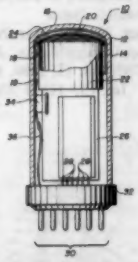
members, thereby providing a low impedance electrical interconnection between said anode and said metallic member, said anode ring having a height, h, an inside radius, r, and a thickness, t, related by the formula $h=0.5(rt)^{\frac{1}{2}}$.

4,456,852

MESH STRUCTURE FOR A PHOTOMULTIPLIER TUBE

Richard D. Faulkner, Lancaster, and Dale V. Henry, Willow Street, both of Pa., assignors to RCA Corporation, New York, N.Y.

Filed Jan. 27, 1982, Ser. No. 343,179
Int. Cl.³ H01J *1/46, 1/52, 17/04, 17/12, 19/38, 19/40, 21/10*
U.S. Cl. 313—348 **4 Claims**



1. An electrically conductive planar mesh electrode structure that facilitates forming into a non-planar mesh electrode structure including:

a peripheral support ring lying in a first plane;

a plurality of first members lying in said first plane, said first members comprising substantially concentric, spaced-apart mesh rings or progressively decreasing diameter disposed within said peripheral support ring; and

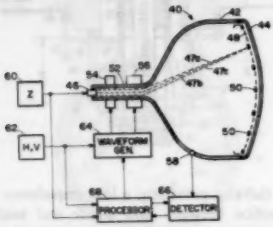
a plurality of second members having a generally arcuate shape lying in said first plane and extending generally inwardly from said peripheral support ring and terminating at the innermost of said first members, said second members intersecting said first members to form, with said intersected first members, a plurality of apertures, said generally arcuate shape of said second members permitting said second members to be formable into a second plane substantially orthogonal to said first plane without significantly stretching said second members.

4,456,853

FEEDBACK CRT FOR USE IN A CLOSED-LOOP CORRECTION SYSTEM

Ronald C. Robinder, Beaverton; David J. Bates, West Linn, and Dan F. Denham, Portland, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 6, 1981, Ser. No. 280,419
Int. Cl.³ H01J *29/51, 29/54*
U.S. Cl. 313—421 **29 Claims**



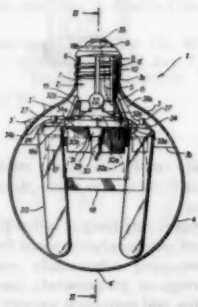
1. A cathode-ray tube comprising a display screen of phosphorescent material, an electron gun for producing an electron beam directed toward said display screen, a shadow mask interposed between said electron gun and said display screen, and a feedback element disposed at a preselected location on a surface of said shadow mask, said element being formed of a material capable of providing a detectable response upon bombardment by said beam and configured to provide, upon scanning by the beam, information denoting the location of the beam in two dimensions.

4,456,854

COMPACT FLUORESCENT LAMP

Kimio Osada; Motokazu Hayashi, and Taketo Kamei, all of Yokosuka, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jun. 30, 1981, Ser. No. 279,199
Claims priority, application Japan, Jul. 15, 1980, 55-96784; Jul. 15, 1980, 55-96785; Jul. 15, 1980, 55-96786
Int. Cl.³ H01J *7/44*
U.S. Cl. 315—58 **9 Claims**



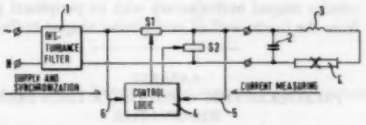
1. A compact fluorescent lamp comprising:
a chassis member;
a screw base secured to said chassis member;
a base member attached to said chassis member;
a winding envelope, including a bent part integrally connected to end parts, attached to said chassis member;
a ballast mounted to said chassis member; and
a globe member attached to said base member;
wherein said chassis member comprises:
a cylindrical part including a generally cylindrical screw thread portion to which said screw base is secured, and a cylindrical straight portion to which said base member is attached;
a holding plate provided with fixing wall members for fixing said ballast; and
a maintaining plate for holding the end parts of said winding envelope and a glow starter
wherein said cylindrical part includes at least a first elongated recess formed in said screw thread portion and said straight portion on the outside thereof for guiding a lead wire of an electrode mounted to said winding envelope.

4,456,855

INTENSITY REGULATOR, ESPECIALLY A LIGHT REGULATOR

Martti Sairanen, Vantaa, Finland, assignor to Oy Helvar, Helsinki, Finland

Filed May 24, 1982, Ser. No. 381,145
Claims priority, application Finland, Jun. 15, 1981, 811867
Int. Cl.³ G05F *1/00*; H05B *37/02*
U.S. Cl. 315—308 **8 Claims**



1. Intensity regulator, especially a light regulator suitable for the regulation of light intensity of both compensated and uncompensated illuminators connected to the alternating-current mains, said regulator comprising one or more switch elements disposed in a circuit between the mains and the illuminator, as well as a control circuit for the switch element or elements which upon the regulation of intensity breaks the supply current at least once on each half-cycle when current has been conducted from the O-moment of a half-cycle until the moment of a desired set value, characterized in that a switch element (S1) is a two-way switch element connected in series with a load (L) and controlled on each half-cycle to break the current only from the mains towards the load but to permit the current flow in the opposite direction, and that another two-way switch element (S2) is coupled parallel to load (L) and controlled on each half-cycle to block the mains voltage directed current flow but to permit the oppositely directed current flow through said second switch element (S2).

4,456,856

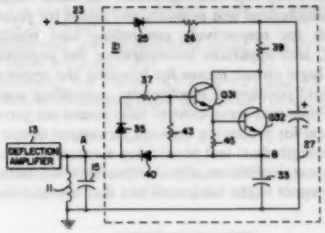
RESONANT FLYBACK BOOST CIRCUIT

Roland W. Klinger, Congers, N.Y., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Jul. 7, 1983, Ser. No. 511,606
Int. Cl.³ H01J *29/70, 29/76*
U.S. Cl. 315—408 **20 Claims**

1. A flyback boost circuit for use with a video system having a magnetic deflection coil yoke, characterized by:
(a) a boost capacitor;
(b) first gating means, connected to the boost capacitor in a series circuit, the series circuit being connected in parallel with the yoke;
(c) a power source;
(d) second gating means connected to the power source and to a point between the first gating means and the boost capacitor so that, when the second gating means is conducting, the second gating means is able to charge the boost capacitor; and
(e) means to control the second gating means so as to admit current to the boost capacitor when the video system is in

its flyback mode, wherein the first gating means admits current from the boost capacitor to the yoke when a



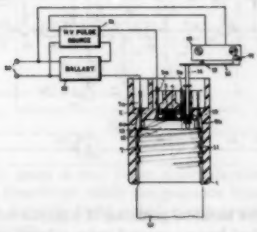
potential across the boost capacitor exceeds a potential across the yoke.

4,456,857

SOCKET WITH AUTOMATIC HIGH VOLTAGE CUT-OFF

Wallace H. Orr, Saluda, and Mitchell M. Osteen, Zirconia, both of N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 29, 1982, Ser. No. 426,485
Int. Cl.³ H05B *37/02*
U.S. Cl. 315—360 **9 Claims**



1. A socket for accommodating a high intensity discharge lamp of the type having a screw base including an eyelet serving as a terminal, comprising:

a generally cylindrical housing of electrically insulating material closed at one end and open at its bottom end,

a screw-threaded metal shell fastened within said housing and adapted to have the base of a lamp screwed up into it,

a center contact in the closed end of said housing for engaging the eyelet of said lamp base,

a movable actuator extending from within said metal shell through an opening in said housing, said actuator being engaged and moved by the base of said lamp when said lamp is screwed home into the socket,

and a normally open switch for disabling the primary of a circuit providing high voltage to said socket, said switch being arranged to be closed by said actuator near its limit of movement.

4,456,858

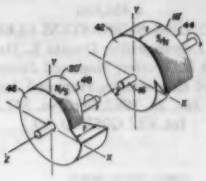
PERMANENT MAGNETIC A.C.-D.C. MOTOR

James F. Loven, 815 Monroe Ave., Scranton, Pa. 18510

Filed Oct. 15, 1981, Ser. No. 311,517
Int. Cl.³ H02P *3/08*
U.S. Cl. 318—138 **27 Claims**

1. A rotary permanent magnet machine receiving rotational power from the interaction of at least two permanent magnetic fields, comprising in combination:

at least two adjacent coaxial permanent magnetic members, one of which is fixed and the other of which is rotatably movable, said magnetic members each comprising mutually reverse spiral-like curvilinear magnet configurations of selective polarity and having surfaces the outer edges of which have a radius which expands in an arithmetic or geometric progression to provide interacting mutually repulsing or attracting magnetic fields which rotate the



rotatable movable member to a position of field equilibrium; and

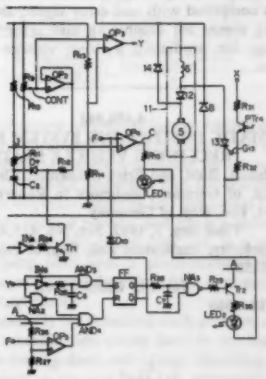
means for rotating the rotatably movable member past the position of magnetic field equilibrium to an eccentric field condition whereupon continued rotation is caused by said interacting fields until the position of field equilibrium is reached in the subsequent rotational period.

4,456,859

SEWING MACHINE DRIVE MOTOR CONTROL SYSTEM

Kazuo Watanabe, Hachioji; Hachiro Makabe, Fussa; Akira Orii, Sagamihara; Michio Hisatake, Hino, and Kazuji Yamamoto, Koganei, all of Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Division of Ser. No. 028,185, Apr. 9, 1979, Pat. No. 4,323,833.
This application Nov. 30, 1981, Ser. No. 325,744
Claims priority, application Japan, Apr. 12, 1978, 53-42178; Apr. 20, 1978, 53-45905; May 18, 1978, 53-59428
Int. Cl.³ H02P *5/16*
U.S. Cl. 318—313 **3 Claims**



1. A speed control circuit of a motor used in combination with a sewing machine having a main drive shaft rotated by the motor to operate the stitch forming device of the sewing machine, said speed control circuit including a controller, thyristors (10) for controlling the rotation of the motor in dependence upon the operation of the controller, said speed control circuit further comprising means (OP_1) for producing a constant triangular wave voltage, means (C_2, OP_2) responsive to operation of the controller to change the constant triangular wave voltage into a variable speed-designating voltage (J) in a period of an AC power source, a frequency-voltage converter receiving a frequency representing the rotation speed of the main drive shaft of the sewing machine so as to produce the

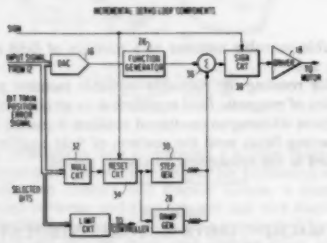
corresponding voltage (F), a comparator comparing the variable speed-designating voltage (J) and the voltage of said frequency-voltage converter to detect a motor drive phase (C) of the speed-designating voltage (J), and control means (LED_1, PTr_1) activated by the motor drive phase of the speed-designating voltage (J) to ignite the thyristors (10).

4,456,860

X-Y POSITIONING SUBSYSTEM ELECTRONICS

George W. Cana, Lagrangeville; Donald E. Davis, Wappingers Falls, and Ralph R. Trotter, Hopewell Junction, all of N.Y., assignors to IBM Corporation, Hopewell Junction, N.Y.

Filed Jan. 25, 1982, Ser. No. 342,321
Int. Cl.³ G05B *13/00*
U.S. Cl. 318—561 11 Claims



1. A positioning system for moving a structure to a predetermined position comprising:

motor means to move said structure;

means to sense the position of said structure as it is being moved;

means to produce an error signal representing the difference between the predetermined and actual positions;

signal generating means responsive to said error signal for generating a voltage which increases, in amplitude rapidly when compared with said error signal; and

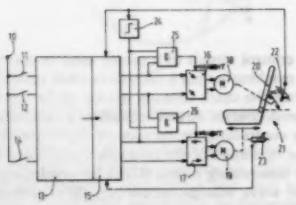
summing means for combining said error signal and said voltage for producing a drive voltage to said motor means.

4,456,861

AUTOMATIC POSITIONING SYSTEM FOR FULLY RECLINING VEHICLE SEATS

Rüdiger Ratzel, Bühl, and Erich Schneider, Kirchheim, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 7, 1982, Ser. No. 415,433
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1981, 3137150
Int. Cl.³ G05B *19/42*
U.S. Cl. 318—568 3 Claims



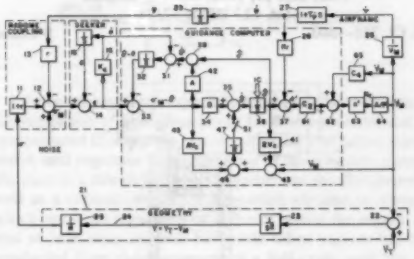
1. Apparatus for controlling coordinated operation of a plurality of positioning mechanisms for fully reclinable vehicle seats by electrical servo-control loop means in response to the activation of signals respectively representing a desired seat-back inclination setting and a sesired longitudinal seat position, said servo-control loop means including means for generating signals respectively representing actual seat-back inclination and actual longitudinal seat position, and means for producing error signals for respectively controlling said positioning mechanisms, said apparatus incorporating the improvement comprising logic circuit means for blocking the operation of the one of said positioning mechanisms controlling seat-back inclination while said servo-control loop means are providing an error signal for producing forward movement of seat position by said longitudinal seat positioning mechanism so long as said actual seat inclination signal represents an inclination angle with respect to the horizontal less than a predetermined angle (α).

4,456,862

AUGMENTED PROPORTIONAL NAVIGATION IN SECOND ORDER PREDICTIVE SCHEME

William R. Yueh, Claremont, Calif., assignor to General Dynamics, Pomona Division, Pomona, Calif.

Filed Sep. 22, 1982, Ser. No. 421,539
Int. Cl.³ G05B *13/00*
U.S. Cl. 318—561 5 Claims



1. A method for terminal guidance of a missile to intercept a target, said method being a second order scheme employing a predictive proportional navigation system including an autopilot, an intertial reference unit and a noise adaptive guidance computer, said system including noise and radome error compensation, said computer having an adaptive guidance filtering system, said proportional navigation system having input values for line of sight (LOS) angle σ, antenna electrical boresight error angle ϵ, angle θ between the antenna axis and the missile axis, the rate of change $\dot{\theta}$ of the angle θ, and time varying noise-adaptive time constants τ_d and τ_o, where $\epsilon=\sigma_M-\theta$, deriving a modified value of LOS angle σ_M, an estimate of LOS angle σ and a residual LOS angle $\sigma_M-\sigma$, the output of said filtering system being a smoothed line of sight rate $\dot{\sigma}$, actual missile lateral acceleration being detected by said inertial reference unit, the output of said inertial reference unit being a measure of actual lateral acceleration Y_M, said method comprising the steps of:

applying the boresight error angle ϵ to a first combining point;

multiplying the residual LOS angle from said first combining point by a gain A to provide the value $A(\sigma_M-\sigma)$;

combining the value $A(\sigma_M-\sigma)$ with the LOS rate $\dot{\sigma}$ at a second combining point to provide an estimated LOS rate $\dot{\sigma}$;

combining said estimated LOS rate $\dot{\sigma}$ with said rate $\dot{\theta}$ to provide the value $\dot{\sigma}-\dot{\theta}$;

integrating the value $\dot{\sigma}-\dot{\theta}$ to provide $\sigma-\theta$;

feeding back the value $\sigma-\theta$ to said first combining point;

combining said value $\sigma-\theta$ with the angle ϵ to provide the value $\sigma_M-\sigma$ at the input to said filtering sytem;

multiplying the residual LOS angle by a gain B to provide the term $B(\sigma_M-\sigma)$;
multiplying the LOS rate σ by $2V_c$;
combining said multiplied LOS rate with acceleration term Y_M at a third combining point to provide the term $2V_c\sigma-Y_M$;
multiplying the residual LOS angle by AV_c to provide the value $AV_c(\sigma_M-\sigma)$;
combining the values $AV_c(\sigma_M-\sigma)$ and $2V_c\sigma-Y_M$ at a fourth combining point to provide the value

$$2V_c\sigma-Y_M+AV_c(\sigma_M-\sigma);$$

dividing the value $2V_c\sigma-Y_M+AV_c(\sigma_M-\sigma)$ by the range R between said missile and the target to provide the value

$$\frac{2\sigma}{T_{go}}-\frac{Y_M}{V_cT_{go}}+\frac{A}{T_{go}}(\sigma_M-\sigma);$$

combining the immediately preceding value with the term $B(\sigma_M-\sigma)$ at a fifth combining point to provide the corrective and predictive term

$$\sigma=\frac{2\sigma}{T_{go}}-\frac{Y_M}{V_cT_{go}}+\left(B+\frac{A}{T_{go}}\right)(\sigma_M-\sigma);\text{ then}$$

integrating the term σ to provide the smoothed LOS rate σ; where

$$A=\frac{1}{\tau_d}+\frac{1}{\tau_c}$$

and

$$B=\frac{1}{\tau_d\tau_c};$$

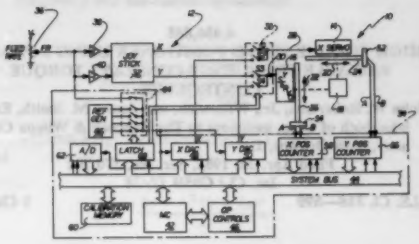
whereby gains A and B are noise-adaptive and dependent upon time-to-go, while the guidance filter output σ is also range dependent and includes both corrective and predictive terms;
multiplying said guidance filter output by a gain C_2 and applying that product to a sixth combining point;
multiplying the missile lateral acceleration term Y_M by a gain C_4 which is a function of autopilot dynamics λ_M and T_{go}, the value C_4Y_M being fed back to said sixth combining point;
multiplying said sixth combining point output $C_4Y_M+C_2\sigma$ by the navigation ratio n' which is also a function of autopilot dynamics and T_{go}; and
applying the immediately preceding term to said autopilot as command acceleration to modify the position of the missile control surfaces and to account for first order autopilot time lag, thereby providing nearly optimal miss distance and low sensitivity to radome error.

4,456,863
APPARATUS FOR AUTOMATIC CALIBRATION OF SERVO RESPONSE

Robert D. Matusek, Parma, Ohio, assignor to Cleveland Machine Controls, Inc., Cleveland, Ohio

Filed Dec. 23, 1980, Ser. No. 220,150
Int. Cl.³ G05B *19/24*
U.S. Cl. 318—572 **12 Claims**

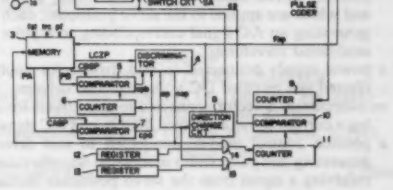
1. In a system wherein at least two servos move an object in respective dimensions of movement and are controlled by velocity control signals provided by a servo control, the improvement comprising means for storing calibration signals characterizing the relationship between applied velocity control signals and the actual resulting velocity responses of the servos, and means for modifying the velocity control signals provided to said servos in accordance with said stored calibration signals so as to reduce spurious variations in object velocity which would otherwise be introduced by nonidealities of said servo responses.



4,456,864
CLAMPING TRACER CONTROL SYSTEM

Ryoji Imazeki; Etsuo Yamazaki, and Takao Sasaki, all of Hachioji, Japan, assignors to Fanuc Ltd., Tokyo, Japan

Continuation of Ser. No. 118,980, Feb. 6, 1980, abandoned. This application Dec. 4, 1981, Ser. No. 327,475
Int. Cl.³ H02P *5/06*
U.S. Cl. 318—578 **4 Claims**



1. In a control system for controlling the tracing operation of a tracer head over a predetermined portion of the surface of a model, said tracing operation proceeding by alternately feeding said tracer head along respective pick and tracing feed axes to pass between respective starting and end points corresponding to said model surface portion, said tracing operation being limited along a respective clamp feed axis to a successively incremented clamp limit until a predetermined final clamp position is attained or until the clamp limit does not occur, the improvement comprising

detection means (1) for detecting each position on the pick feed axis where a first clamp limit is reached during a respective tracing feed, and (2) for detecting the subsequent position on the pick feed axis, after each said reaching of the first clamp limit, where said clamp limit first does not occur during a subsequent tracing feed,

repetition means for repeatedly moving back and forth between said two detected positions, prior to continuing said tracing operation between said start and end points, at successively incremented clamp limits until the respectively incremented clamp limit does not occur or a predetermined maximum clamp limit is obtained, and for subsequently continuing with said tracing operation between said start and end points of said tracing operation at said first clamp limit,

wherein said tracing operation involves only a single tracing between said start and end points at said first clamp limit

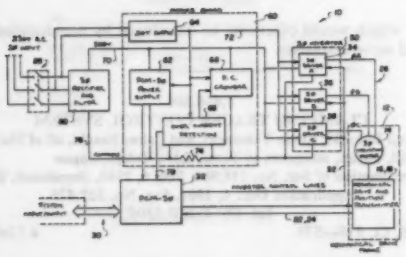
and the repeated moving between each respective pair of said detected positions on the feed axis at said incremented clamp limits.

4,456,865

HIGH TORQUE SERVO POSITIONER USING 3 PHASE VARIABLE FREQUENCY CONSTANT TORQUE CONTROLLER

John W. Robertson, Jr., Willowick, and James M. Smith, Eastlake, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Apr. 22, 1982, Ser. No. 370,702
Int. Cl.³ G05B *11/28*
U.S. Cl. 318—599 **1 Claim**



1. A three phase variable frequency constant torque controller for a high torque servo positioner comprising:
- an inverter including a plurality of drivers for generating a plurality of AC signals which are mutually out of phase and which are applied to the servo positioner, each driver generating an AC signal corresponding to a pulse width modulated waveform;
- a power supply connected to said drivers for applying a filtered and rectified DC voltage to said drivers;
- an overcurrent detector connected to said drivers for detecting a current above a selected limit in said AC signals; and
- a position control module connected to said drivers for generating said pulse width modulated waveforms and for receiving a signal from the servo positioner indicating a position thereof, said position control module adapted to receive digital signals and analog signals, said analog signals corresponding to gain, set point, feedback and dead band signals for the servo positioner;
- said position control module comprising a programmable microprocessor, a read only memory connected to said microprocessor for carrying a plurality of tables corresponding to said plurality of pulse width modulated signals, an analog to digital converter for receiving the analog signals and converting them to digital signals readable by said microprocessor, a plurality of timers connected to said microprocessor for generating said pulse width modulated signals and for generating interrupt signals, said position control module connected to said overcurrent detector for initiating an interrupt signal upon detection of an overcurrent.

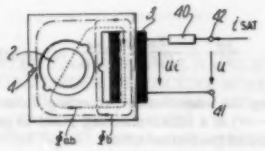
4,456,866

METHOD FOR SLAVING A STEPPING MOTOR AND ARRANGEMENT FOR PRACTISING THE METHOD

Mai Tu Xuan, Chavannes, and Michel Grosjean, Bienne, both of Switzerland, assignors to Omega S.A., Bienne, Switzerland

Filed Mar. 25, 1982, Ser. No. 361,997
Claims priority, application Switzerland, Mar. 31, 1981, 2165/81
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **9 Claims**

1. A method for slaving a steping motor driven by a bipolar pulse train to the load imposed by a timepiece mechanism by supplying to said motor control pulses of at least three different increasingly longer durations, said method comprising the steps of:
- measuring at the motor winding terminals the induced voltage Ui generated by rotation of the rotor responsive to a control pulse n of duration T_1;
- comparing said induced voltage to a predetermined threshold;
- whenever said induced voltage is less than said threshold applying two recovery pulses of substantially greater width and duration T_a following said control pulse n;
- thereafter driving the motor from pulse n+1 on by pulses of greater duration T_2;



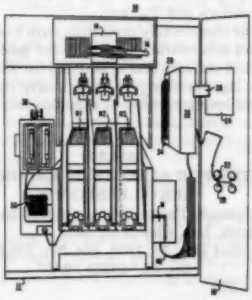
- measuring the induced voltage Ui generated by rotation of the rotor responsive to a control pulse n+2 and comparing said induced voltage to said threshold;
- whenever said induced voltage is less than said threshold applying two recovery pulses of duration T_a following said control pulse n+2;
- thereafter driving the motor from pulse n+3 on by pulses of further increased duration T_3;
- continuing the method in the same manner with the leading flank of the control pulses n, n+1, n+2, n+3, etc., being separated by a constant time interval and the pulse durations established so that $T_1<T_2<T_3<$etc.

4,456,867

MOTOR CONTROL APPARATUS WITH INPUT VALIDATOR

George T. Mallick, Jr., Penn Hills, and Pamela M. Maynard, Wilkinsburg, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 20, 1983, Ser. No. 486,752
Int. Cl.³ H02P *1/24*
U.S. Cl. 318—778 **5 Claims**



1. Motor control apparatus, comprising:
- contactor means for being actuated to control a motor in response to the occurrence of a predetermined event;
- microprocessor control means interconnected with said contactor means for actuating said contactor means to

control said motor in response to a sampled ON condition in a digital signal over a predetermined period of time;

alternating-current status means for providing an ON alternating-current output signal therefrom of predetermined frequency on the occurrence of said event;

coupler means interconnected with said alternating-current status means and said microprocessor control means for receiving said ON alternating-current output signal and for providing to said microprocessor-control means a digital output signal varying between high and low with a duty cycle which is generally equal to 50% within limits; and

memory means interconnected to said microprocessor control means for having stored therein the number of times a high condition in said digital output signal is detected by sampling said digital output signal Z generally equally spaced times in each of X duty cycles, said microprocessor control means actuating said contactor means to control said motor after said X duty cycles only if the number of high conditions detected during all of said X duty cycles is equal to or less than (Z)(X)/2.

4,456,868

METHOD AND APPARATUS FOR CONTROLLING AC MOTORS

Sakae Yamamura, Komae, and Shigeki Kawada, Hino, both of Japan, assignors to Fanuc Limited, Tokyo, Japan

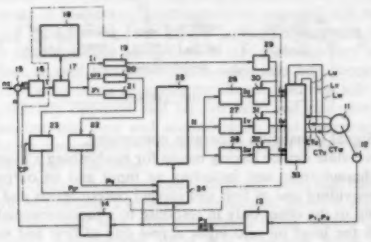
PCT No. PCT/JP82/00086, 371 Date Nov. 26, 1982, 102(e) Date Nov. 26, 1982, PCT Pub. No. WO82/03508, PCT Pub. Date Oct. 14, 1982

PCT Filed Mar. 30, 1982, Ser. No. 445,370

Claims priority, application Japan, Mar. 31, 1981, 56/047933; Mar. 31, 1981, 047934; Mar. 31, 1982, 56/047932

Int. Cl.³ H02P 1/26

U.S. Cl. 318—800 **8 Claims**



8. A method for controlling an AC motor in accordance with a slip frequency, a phase difference, a primary current amplitude, a commanded speed and an actual speed, said method comprising the steps of:

(a) computing a torque command in accordance with the difference between said commanded speed and said actual speed;

(b) computing the slip frequency in accordance with the torque command, and the following relation

$$T = 3r_2 I_0^2 / \left[\frac{k_2}{\omega_s} + \frac{\omega_s}{k_1} \right]$$

wherein T corresponds to said torque command, and

$$k_2 = \left(\frac{r_2}{l_m} \right)^2 , k_1 = \left(\frac{l_m}{l_2} \right)^2$$

where r_2 is the secondary resistance, l_m is the excitation inductance, l_2 is the secondary leakage inductance, w_s is the slip frequency and I_o is the excitation current;

(c) computing the primary current amplitude using said slip frequency and the following equation

$$I_1 = \sqrt{\frac{1 + k_4\omega_s^2 + k_5\omega_s^4}{1 + k_3\omega_s^2}} \cdot I_o$$

wherein $k_3 l_2^2$, $k_4 = 1/r_2^2 \cdot 2l_2(l_2 + l_m) + r_2^2 l_m^2)$, and

$$\frac{k_5 = l_2^2 (l_2 + l_m)^2}{r_2^4} ;$$

(d) computing a phase difference using said slip frequency and the following relation

$$\text{phase difference} = \tan^{-1} \frac{1}{\left(\frac{K_6}{\omega_s} + \frac{\omega_s}{K_7} \right)}$$

$$\text{where } k_6 = \frac{r_2}{l_m} , k_7 = \frac{r_2}{l_2} \left(\frac{l_m}{l_2 + l_m} \right) ;$$

(e) determining an angular frequency in accordance with the actual speed of AC motor;

(f) generating a three-phase primary current command using the slip frequency, the phase difference, the primary current amplitude and the angular frequency; and

(g) driving the AC motor in accordance with said three-phase primary current command.

4,456,869

AUTOMATIC BATTERY CHARGER

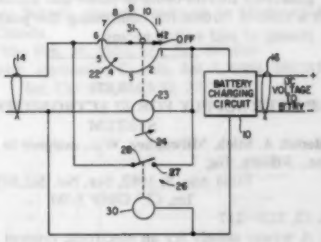
Leonard Schub, 5606 Melaleuca Dr., Tamarac, Fla. 33319

Filed Oct. 12, 1982, Ser. No. 433,654

Continuation-in-part of Ser. No 317,465, Nov. 2, 1981

Int. Cl.³ H02J 7/04

U.S. Cl. 320—38 **3 Claims**



1. An automatic battery charger for use with battery powered vehicles, comprising

a battery charging circuit adapted to be connected to the batteries within the vehicle, said battery charging circuit including means for connecting said circuit to an alternating voltage source,

a manually timed charging switch connected between said alternating voltage source and said battery charging circuit for enabling a charge to be applied to said battery for a preselected time interval, and

means for maintaining said batteries in a substantially fully charged condition, said means comprising an automatically timed charging switch connected in parallel with said manually timed charging switch, said automatically

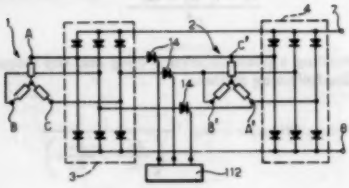
timed charging switch including an electric clock adapted to be connected across said alternating voltage source for closing the terminals of said automatically timed charging switch for preselected periodic intervals.

4,456,870

SPLIT WINDINGS MOTOR VEHICLE ALTERNATOR

Gianpiero Rodari, Bussero, Italy, assignor to Marelli Autronica S.p.A., Pavia, Italy

Filed Jul. 23, 1982, Ser. No. 401,058
Claims priority, application Italy, Jul. 23, 1981, 68026 A/81
Int. Cl.³ H02M *7/00*; H02P *9/00*
U.S. Cl. 322—29 **6 Claims**



1. An alternator arrangement, particularly for motor vehicles, comprising:

(a) a 3-phase induction winding subdivided into two 3-phase half-windings (1,2),

(b) two 3-phase full wave rectifier circuits (3,4) individually associated with said two half-windings,

(c) means individually connecting output terminals of each half-winding to input terminals of an associated rectifier circuit,

(d) means individually connecting output terminals of each rectifier circuit in parallel across a pair of alternator output terminals (7,8),

(e) three two-state switch means (14) for individually connecting selected non-homologous output terminals of said two half-windings together such that when said switch means are open said half-windings are connected in parallel and when said switch means are closed said half-windings are connected in series with individual phase signals generated therein being in-phase and additive, and

(f) a control circuit for controlling the joint opening and closing of said switch means.

4,456,871

POWER SUPPLY FOR ELECTRONIC CONTROL SYSTEM

Frederick A. Stich, Milwaukee, Wis., assignor to Siemens-Allis, Inc., Atlanta, Ga.

Filed Apr. 5, 1982, Ser. No. 365,861
Int. Cl.³ G05F *5/00*
U.S. Cl. 323—217 **9 Claims**

1. A power supply for an electronic control system or the like and adapted to be applied to widely varying sources of alternating voltage, and to output a regulated control voltage which is substantially invariant, comprising:

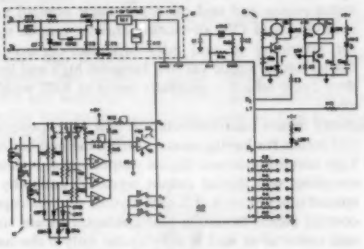
an input terminal for receiving said alternating voltage;

a series combination of a first resistance means and a voltage threshold means coupled between said first terminal and a point of reference potential:

a series combination of a second resistance means and a first capacitor connected in series between the intersection of said first resistance means and said voltage threshold means, and said point of reference potential;

a thyristor having a pair of main terminals coupled to the anode and cathode thereof and having a gate electrode, said gate electrode being coupled to the intersection of said second resistance means and said first capacitor, one of said main terminals being coupled to said input terminal; and

a second capacitor coupled between the other of said main terminals and said point of reference potential,



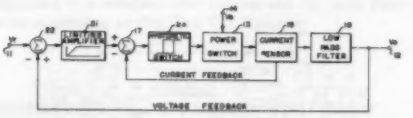
whereby the application of said alternating voltage to said input terminal effects a regulated voltage V_r across said second capacitor, and the periodic duration of conduction of said thyristor varies inversely with the value of voltage V_r.

4,456,872

CURRENT CONTROLLED TWO-STATE MODULATION

Thomas A. Froeschle, Framingham, Mass., assignor to Bose Corporation, Framingham, Mass.

Continuation of Ser. No. 869,520, Oct. 27, 1969, abandoned.
This application Feb. 24, 1972, Ser. No. 229,082
Int. Cl.³ G05F *1/56*; H02M *3/335*
U.S. Cl. 323—286 **19 Claims**



1. Signal translation apparatus comprising,

a two-state device having means for establishing a hysteresis characteristic and including an input and an output for providing one of first and second output levels and shifting to the other only in response to a predetermined shift in the level on said input across one of first and second different threshold levels,

an input terminal for receiving an external signal,

means for combining a current feedback signal of frequency corresponding to the rate at which the shift between said first and second levels occurs representative of the current delivered by said output with a signal related to that applied to said input terminal to provide a combined signal at the combining means output of frequency corresponding to said rate,

means for coupling the output of said combining means to said input to shift said two-state device output between said first and second levels when said combined signal crosses said first and second threshold levels respectively whereby the signal at said output includes a characteristic representative of the signal at said input terminal,

said output signal characteristic being its average value over a cycle,

averaging means,

means for coupling said two-state device output to said averaging means to provide a signal having a waveform corresponding substantially to that of the signal then received by said input terminal,

said means for coupling including essentially nondissipative means for blocking spectral components of the energy at

said two-state device output from said averaging means which spectral components are of frequency at least as high as the rate at which the shift between said first and second levels occurs,

means for providing a voltage feedback signal representative of a signal provided by said averaging means,

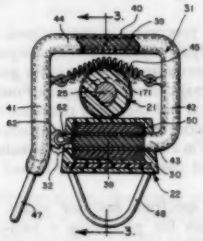
and means for coupling said voltage feedback signal to said means for combining to provide said combined signal that is related to said current feedback signal, the signal applied to said input terminal, and said voltage feedback signal.

4,456,873

CABLE MOUNTED MAGNETIC CORE ASSEMBLY

Edmund O. Schweitzer, Jr., 1002 Dundee Rd., Northbrook, Ill. 60118

Filed Aug. 4, 1981, Ser. No. 289,916
Int. Cl.³ G01R *31/02, 1/20;* H01F *17/06*
U.S. Cl. 324—51 **32 Claims**



1. A fault indicator for indicating the occurrence of a fault current in an electrical conductor, comprising:

magnetic core means comprising a plurality of elongated strips of resilient magnetic material arranged side by side and joined at the ends thereof to form a magnetic core;

said magnetic core being formed into a closed loop having first, second, third and fourth sides, said first, second and third sides being generally rectilinear, said first side being generally opposite said second side, and said third side joining said first and second sides, said magnetic core being dimensioned to receive within said closed loop said electrical conductor;

interlocking connection means disposed along said third side for establishing a separable connection between segments of said third side, said connection being locked against lateral displacement upon said segments being urged toward axial engagement;

biasing means comprising a spring member extending between said first side and said second side for drawing said sides together whereby said segments are urged toward axial engagement, said spring member being positioned to engage the conductor opposite from said third side to urge the conductor into contact with said third side;

current-responsive means disposed along said third side of said magnetic core in magnetic communication with the conductor for providing a control effect upon the occurrence of a fault current in the conductor; and

means responsive to said control effect for providing a fault indication.

4,456,874

ANALYSER FOR ELECTROMOTIVE DEVICE

Keith Anderson, 44715 Beech St., Lancaster, Calif. 93534

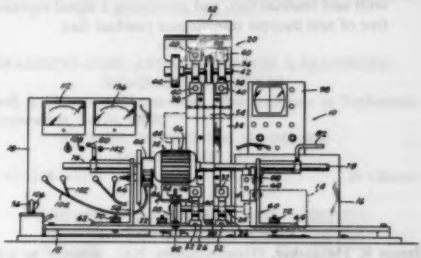
Filed Jan. 11, 1982, Ser. No. 338,337
Int. Cl.³ G01R *31/02*
U.S. Cl. 324—51 **6 Claims**

1. An analyser for testing electromagnetic devices for mechanical faults which may render said device electrically inoperative due to a short therein, open circuit therein, grounding therein or a combination thereof, wherein said analyser includes:

a base member;

a motor driven electromagnetic device drive means pivotally secured on said base and adapted to be moved into and out of contact with said electromagnetic device dependent upon the test to be conducted, said drive means including a rotatable contact member adapted to directly engage said device;

a retention means mounted on said base adapted to receive and maintain therein said electromagnetic device for testing said device includes adjustable stand elements to position



said electromagnetic device therebetween in locked position against vertical movement and said device includes bearings to cradle said electromagnetic device for rotation; and

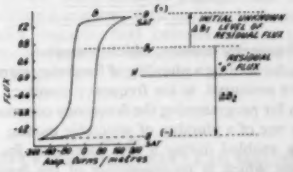
inductive electrical circuitry connectable to said electromagnetic device and adapted to receive an electrical signal impulse therefrom and convert the same to be visually read to determine whether there is a single fault therein or combination of faults as well as to determine the lack thereof, and a coil and oscillator mounted on said base justaposed with said electromagnetic device and slightly spaced therefrom, which when energized will excite said electromagnetic device by induction.

4,456,875

DEMAGNETIZATION CIRCUIT FOR CURRENT TRANSFORMERS

Andre Chenier, Beloeil, Canada, assignor to Hydro-Quebec, Montreal, Canada

Filed Feb. 10, 1982, Ser. No. 347,565
Claims priority, application Canada, Jul. 7, 1981, 381253
Int. Cl.³ G01R *11/52, 27/26*
U.S. Cl. 324—55 **14 Claims**



1. A system for measuring the residual flux in a current transformer, comprising:

control circuit means generating a voltage waveform having two successive levels for reversing current flow in said current transformer, said control circuit means having a series resistance compensating circuit connected across the transformer winding and generating a stop signal to a processing unit upon detection of a predetermined current value flowing in said winding;

switching circuit means connected to said winding of said

current transformer and producing an induction variation from the residual flux level up to saturation by successively switching the current when said voltage waveform is applied across the terminals of said winding; and

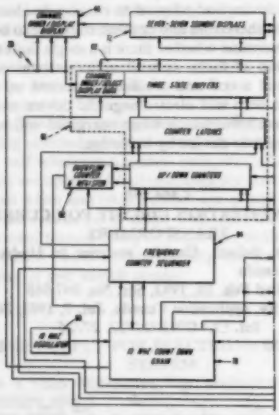
said processing unit receiving from said switching circuit means a first analog signal representative of said induction variation caused by said voltage waveform generated in a first time period and a second analog signal representative of the induction variation caused by said voltage waveform generated in a second time period, said unit determining saturation levels corresponding to a positive variation and to a negative variation of the induction in relation with said residual flux, and generating a signal representative of said current transformer residual flux.

4,456,876

FREQUENCY COUNTER

James R. Haymaker, Winston-Salem, N.C., assignor to AT&T Technologies, Inc., New York, N.Y.

Filed Jun. 14, 1982, Ser. No. 388,307
Int. Cl.³ G01R *23/16*
U.S. Cl. 324—77 R **12 Claims**



1. A frequency counter, which comprises:

means for feeding a plurality of frequency signals, which are to be measured, to the frequency counter;

means for programming the frequency counter to operate in any one of a plurality of selectable modes;

means, enabled during a first gate time, for generating a count which is representative of the frequency of the signals measured;

means for storing the count generated by the generating means;

means for detecting whether the count generated by the generating means has reached a preset maximum count;

means, responsive to the detection of a count which exceeds the preset maximum count by the detection means, for changing to a second gate time within which the generating means is enabled; and

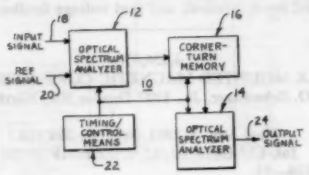
means, for displaying the count stored in the storing means as a representation of the frequency measured.

4,456,877

HYBRID SPECTRUM ANALYZER SYSTEM

Hugh B. Brown, Fremont, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Sep. 16, 1982, Ser. No. 418,902
Int. Cl.³ G01R *23/17*
U.S. Cl. 324—77 K **20 Claims**



1. A system for processing an input signal, comprising:

means for supplying a phase reference signal;

first optical spectrum analyzer means for generating a time/-frequency signal corresponding to a Fourier transform of the input signal and the phase reference signal;

corner-turn memory means for digitally storing the time/frequency signal in a time/frequency domain and for supplying the stored data as a corner-turned frequency/time signal; and

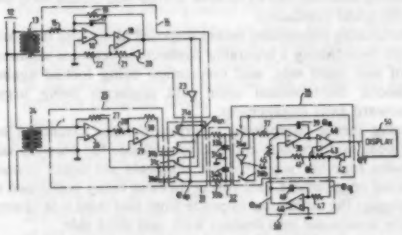
second optical spectrum analyzer means coupled to the memory means for generating a two-dimensional frequency/ frequency signal corresponding to a Fourier transform of the corner-turned frequency/time signal.

4,456,878

ELECTRONIC WATTHOUR METER

Ryouji Gamoh, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed May 19, 1981, Ser. No. 265,237
Claims priority, application Japan, Jun. 4, 1980, 55-75160
Int. Cl.³ G01R *21/06, 1/02*
U.S. Cl. 324—142 **3 Claims**



1. An electronic watthour meter comprising: first means for detecting a voltage signal proportional to a load voltage of power supply lines; second means for detecting a voltage signal proportional to a load current of said power supply lines; a pulse width modulation circuit for subjecting one of said voltage signals to pulse width modulation to obtain a pulse width duty cycle signal; a multiplication circuit for outputting a pulse signal of the product of said voltage signal from said first means and said voltage signal from said second means by switching operation under the control of said pulse width duty cycle signal; a filter circuit for integrating said pulse signal from said multiplication circuit to positive and negative DC voltages; a voltage-to-frequency converter for outputting a pulse signal, said latter pulse signal having a frequency which is proportional to said DC voltages; and automatic offset com-

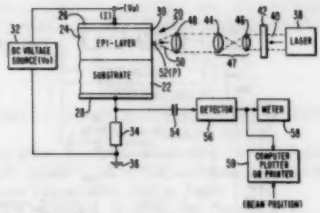
pensation circuit means for integrating the voltage of said pulse signal of said voltage-to-frequency converter and applying the resulting integrated voltage to the input of said voltage-to-frequency converter as a feedback signal.

4,456,879

METHOD AND APPARATUS FOR DETERMINING THE DOPING PROFILE IN EPITAXIAL LAYERS OF SEMICONDUCTORS

Hans P. Kleinknecht, Bergdietikon, Switzerland, assignor to RCA Corporation, New York, N.Y.

Filed Sep. 2, 1981, Ser. No. 298,581
Int. Cl.³ G01R *1/04*
U.S. Cl. 324—158 D **18 Claims**



1. Apparatus for determining the doping profile in an epitaxial layer of semiconductor material comprising:

(a) means for applying direct current to an epitaxial layer of a semiconductor;

(b) means for providing a laser beam modulated at a relatively high frequency;

(c) means for focusing and directing said laser beam to one or more locations in sequence on an exposed surface of said layer to cause photocurrents to generate current flow variations in the layer; and

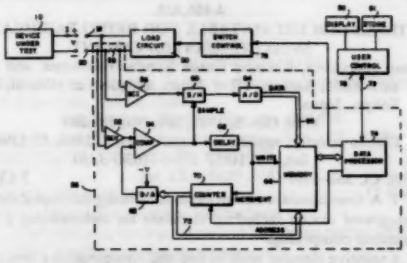
(d) means for monitoring said current flow variations including means for detecting a signal representing said photocurrent variations.

4,456,880

I-V CURVE TRACER EMPLOYING PARAMETRIC SAMPLING

Thomas H. Warner, 25 Tollen St., Boston, Mass. 02116, and Charles H. Cox, III, 31 Berry Corner Rd., Carlisle, Mass. 01741

Continuation-in-part of Ser. No. 345,682, Feb. 4, 1982, abandoned. This application Jul. 26, 1982, Ser. No. 402,040
Int. Cl.³ G01R *31/22*
U.S. Cl. 324—158 D **23 Claims**



1. An I-V curve tracer for measuring an I-V relationship of an electrical device, said tracer comprising:

A. a first sensor for measuring a first parameter of the electrical device,

B. a second sensor for measuring a second parameter of the electrical device,

C. sweep means for varying the first and second parameters of the electrical device,

D. means for determining a third parameter of the electrical device, and

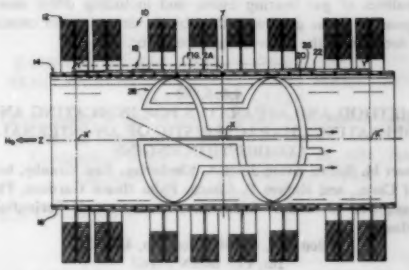
E. data acquisition means for taking samples of the first and second parameters at a sequence of times, said data acquisition means being coupled to said first sensor and said second sensor and to said means for determining the third parameter, said data acquisition means being operative in response to the third parameter of the electrical device so as to determine the times at which the samples are taken.

4,456,881

GRADIENT-COIL APPARATUS FOR A MAGNETIC RESONANCE SYSTEM

Russell A. Compton, Chesterland, Ohio, assignor to Technicare Corporation, Solon, Ohio

Filed Jan. 18, 1982, Ser. No. 340,546
Int. Cl.³ G01R *33/08*
U.S. Cl. 324—319 **18 Claims**



1. In a system for generating magnetic resonance in materials placed in the system for examination, the system having a magnet for providing a static magnetic field and having a gradient-coil subsystem for imposing a gradient on the static magnetic field, the gradient producing a variation in magnetic-field intensity as a function of position in a region in which the gradient is effective, an improved gradient-coil apparatus for imposing a gradient on the static magnetic field in a selected region of predetermined volume, the apparatus comprising:

(a) at least one surface surrounding the selected region; and

(b) at least one electrical conductor positioned in proximity to the surface or surfaces, the conductor or conductors providing a plurality of current paths on the surface or surfaces, current when flowing through such current paths generating a magnetic field intensity in the selected region which magnetic field intensity exhibits a least-squares error relationship with respect to a desired characteristic for the gradient imposed on the static magnetic field.

4,456,882

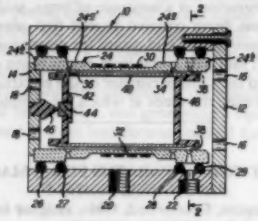
HIGH SPEED CYLINDRICAL NUCLEAR MAGNETIC RESONANCE (NMR) SAMPLE SPINNER

Francis D. Doty, Columbia, S.C., assignor to University of South Carolina, Columbia, S.C.

Filed Jan. 4, 1982, Ser. No. 336,627
Int. Cl.³ G01R *33/08*
U.S. Cl. 324—321 **11 Claims**

1. A high speed cylindrical nuclear magnetic resonance sample spinner comprising a housing for distributing gas under pressure, a stator mounted within the housing for receiving a nuclear magnetic resonance receiver coil and including axially spaced first and second pluralities of circumferentially spaced gas bearing holes formed near the ends of the stator for trans-

mitting the pressurized gas to at least two locations within the stator, each gas bearing hole terminating in an expanded opening at the interior surface of the stator to maintain subsonic flow at the interior surface of the stator, and a further plurality of circumferentially-spaced holes in the form of drive jets



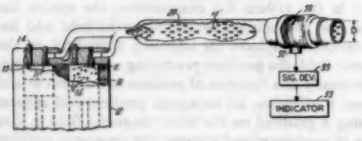
located at one end of the stator for transmitting the pressurized gas to a third location within the stator and a rotor supported within the stator by the gas transmitted by the first and second pluralities of gas bearing holes, and including drive means responsive to the gas transmitted by the drive jets for causing the rotation of the rotor within the stator.

4,456,883

METHOD AND APPARATUS FOR INDICATING AN OPERATING CHARACTERISTIC OF AN INTERNAL COMBUSTION ENGINE

Robert H. Bullis, Avon; John A. Kimberley, East Granby, both of Conn., and Robert P. Couch, Palm Beach Gardens, Fla., assignors to Ambac Industries, Incorporated, Springfield, Mass.

Filed Oct. 4, 1982, Ser. No. 432,501
Int. Cl.³ G01N *27/62*
U.S. Cl. 324—464 **21 Claims**



1. Apparatus for indicating an operating characteristic of a periodically combusting internal combustion engine having duct means defining an exhaust gas path, said engine having an exhaust gas stream issuing in said path in a periodic manner from at least one combustion chamber of the engine, said exhaust gas stream containing electrically-charged particles, said charge being of the same polarity on substantially all of the charged particles at a monitoring location along said path, and said periodic combustion and issuance of exhaust gas causing said charged particles to be grouped in respective periodic packets, said apparatus comprising:

electrically conductive, passive electrode means inductively responsive to electrically-charged particles passing thereby, said electrode means being disposed in proximity with said exhaust gas stream at the monitoring locating in electrical isolation from said duct means for sensing, principally by the induced image charge, the passage and the charge-quantity of the respective packets of charged particles;

means operatively connected to said electrode means and responsive to the sensed passage and charge-quantity of the particle packets for providing an electrical signal having a series of distinct pulsating components corresponding in time with the passage of respective one of said particle packets and corresponding quantitatively with the charge-quantity of the respective ones of said particle packets; and

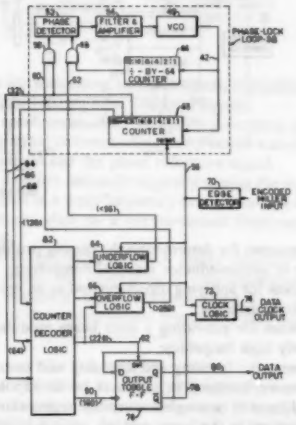
means responsive to at least said pulsating components of said signal for indicating an operating characteristic of the engine.

4,456,884

PHASE-LOCK LOOP AND MILLER DECODER EMPLOYING THE SAME

John M. Yarborough, Jr., Palo Alto, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Nov. 16, 1981, Ser. No. 321,542
Int. Cl.³ H03K *13/24*; H03L *7/18*
U.S. Cl. 329—50 **27 Claims**



1. A phase-lock loop circuit in which the frequency of a controlled oscillator means is locked to an input signal stream, the phase-lock loop comprising,

phase detector means having first and second inputs and having an output coupled to the control input of said controlled oscillator means, the first and second inputs thereof coupled to receive the output of said controlled oscillator means through first and second divide-by-N counters, respectively, for producing a control signal at the output thereof representative of the phase difference between the outputs of said divide-by-N counters, and

means for resetting said second divide-by-N counter in response to the input signal stream.

4,456,885

FILTER CIRCUIT SUITABLE FOR BEING FABRICATED INTO INTEGRATED CIRCUIT

Isao Nakagawa, Katsuta; Kazuo Kondo, Yokohama, and Mitsuru Kudo, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 5, 1981, Ser. No. 308,589
Claims priority, application Japan, Oct. 7, 1980, 55-139400
Int. Cl.³ H03F *1/34*; H03G *3/10*
U.S. Cl. 330—107 **7 Claims**

1. A time-constant circuit capable of being fabricated into an integrated circuit including elements for determining a time constant comprising:

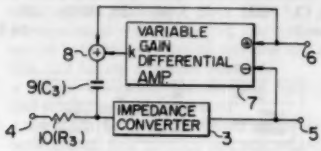
a resistive element with its one end connected to a first input terminal;

an impedance converting circuit with its input connected to another end of said resistive element;

a variable gain differential amplifier with its one input connected to the output of said impedance converting circuit

and another input connected to a second input terminal, and with its gain being variable by an external operation;

an adder circuit for adding a signal entered through said second input terminal and an output signal from said variable gain differential amplifier; and



a capacitive element connected between the input of said impedance converting circuit and the output of said adder circuit.

4,456,886

CONTROL CIRCUIT FOR VOLTAGE CONTROLLED VARIABLE ATTENUATOR

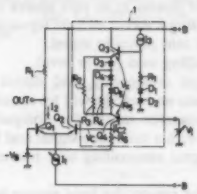
Akira Nishioka; Yoshihiro Kawanabe; Hideki Fujimoto, and Hiroyuki Takahori, all of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 14, 1982, Ser. No. 387,894

Claims priority, application Japan, Jun. 18, 1981, 56-94448

Int. Cl.³ H03G *3/30*

U.S. Cl. 330—254 **9 Claims**



1. A control circuit for a voltage controlled variable attenuator of the type including a differential amplifier, the signal attenuating property of said voltage controlled variable attenuator being controlled by a control voltage applied to an input terminal of said differential amplifier and the attenuated output being obtained at an output terminal of said differential amplifier; said control circuit comprising level control means for receiving an input signal having a varying voltage level and outputting an output signal having inclinations which vary stepwisely in response to said voltage level variation of said input signal, wherein said output signal is applied to said input terminal of said differential amplifier as said control voltage.

4,456,887

DIFFERENTIAL AMPLIFIER

Akio Tokumo, Saitama, Japan, assignor to Pioneer Electronic Corporation, Tokyo, Japan

Filed Sep. 23, 1981, Ser. No. 304,734

Claims priority, application Japan, Sep. 25, 1980, 55-136595[U]; Sep. 26, 1980, 55-137427[U]

Int. Cl.³ H03F *3/45*

U.S. Cl. 330—261 **11 Claims**

1. A differential amplifier, comprising:

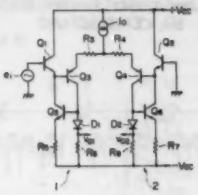
a first transistor having a base and having an output terminal for providing an output signal;

a second transistor having a base and having an output terminal for providing an output signal;

means for applying a differential input to the bases of said first and second transistors;

third and fourth transistors each having a base, said first and second transistor outputs being differentially applied across said third and fourth transistor bases;

means for supplying currents in a predetermined ratio to said first and third transistors and for supplying currents in a



predetermined ratio to said second and fourth transistors; and

means for providing a differential amplifier output in accordance with variations of current flow through at least one of said third and fourth transistors.

4,456,888

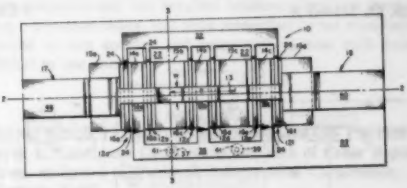
RADIO FREQUENCY NETWORK HAVING PLURAL ELECTRICALLY INTERCONNECTED FIELD EFFECT TRANSISTOR CELLS

Yalcin Ayasli, Waltham, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 247,678, Mar. 26, 1981. This application Aug. 18, 1983, Ser. No. 524,119

Int. Cl.³ H03F *3/60*

U.S. Cl. 330—277 **22 Claims**



1. A radio frequency network, having an input terminal and an output terminal, for electrically coupling or decoupling radio frequency energy fed to the input terminal between such input terminal and the output terminal selectively in accordance with a control signal, comprising:

(a) a plurality of transistor cells, each one of such cells having a reactive element, a control electrode fed by the control signal, and first and second electrodes;

(b) a coupling means, having a first end connected to the input terminal, and having a second end connected to the output terminal, for electrically interconnecting the first electrodes of the plurality of transistor cells between the input terminal and output terminal, such coupling means having an impedance in accordance with the impedance of the reactive elements of the cells to provide such radio frequency network with a predetermined characteristic impedance; and

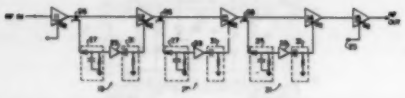
(c) wherein in response to a first state of the control signal, such control signal biases such cells to provide a relatively low resistance between the first and second electrodes of the cells to decouple the radio frequency energy, and in response to a second state of the control signal, such control signal biases such cells to provide a relatively high resistance between the first and second electrodes of the cells to couple the radio frequency energy.

4,456,889

DUAL-GATE MESFET VARIABLE GAIN CONSTANT OUTPUT POWER AMPLIFIER

Mahesh Kumar, South Brunswick, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 4, 1981, Ser. No. 270,747
Int. Cl.³ H03G 3/30
U.S. Cl. 330—279 14 Claims



5. In a constant output power amplifier,

a signal-amplifying stage;

gain control means responsive to variations in the power level of an input signal applied to the stage for preadjusting the gain of the stage to compensate in advance for the variations and maintain constant the power level of the output signal from the stage,

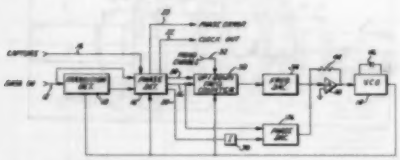
wherein the signal-amplifying stage includes a field effect transistor having a source, drain and first and second gate electrodes.

4,456,890

DATA TRACKING CLOCK RECOVERY SYSTEM USING DIGITALLY CONTROLLED OSCILLATOR

Richard C. Carickhoff, Lansdale, Pa., assignor to Computer Peripherals Inc., Minneapolis, Minn.

Filed Apr. 5, 1982, Ser. No. 365,698
Int. Cl.³ H03L 7/08
U.S. Cl. 331—1 A 7 Claims



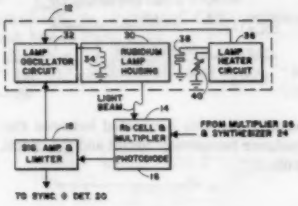
1. A clock recovery system for generating an output clock signal locked to the phase and frequency of an input data rate, said input data rate comprising a sequence of encoded data signals, said system comprising, in combination: data detector means for detecting said data signals; oscillator means responsive to an analog signal for generating a first clock signal having a frequency of oscillation representative of the value of said analog signal; phase detector means comprising memory means and register means, said register means being responsive to said first clock signal for cyclicly counting the oscillations of said first clock signal to generate said output clock signal, and said memory means being responsive to the count in said register means and to the output of said data detector means for determining the relative phase relationship between each said data signal and said output clock signal and for storing information pertaining to said relative phase relationship; counter means for containing a count; converter means responsive to the count in said counter means for generating said analog signal; said memory means being responsive to the relative phase relationship of a data signal and to the stored information pertaining to a previous relative phase relationship to operate said counter means to selectively increment or decrement the count therein to thereby alter the frequency of said first clock signal.

4,456,891

RADIO FREQUENCY SOURCE CIRCUIT PRIMARILY FOR IGNITING THE LAMP OF A RUBIDIUM FREQUENCY STANDARD

William R. Fowks, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 20, 1981, Ser. No. 284,416
Int. Cl.³ H03L 1/02, 5/02, 7/26; H01S 1/00
U.S. Cl. 331—3 14 Claims



1. An atomic frequency standard of the type used for stabilizing a frequency source by tracking it to a hyperfine transition resonance of an atomic frequency resonator having a source of light for optically pumping a resonance cell and a photodiode for detecting resonance and having a light source control circuit comprising:

a field coil in proximity to said source of light,

means for generating a periodic signal through said coil for igniting a slight discharge in said source of light,

means for generating a direct current signal indicative of the power level of said periodic signal,

means for controlling said power level,

a feedback circuit connecting said direct current signal generating means and said power level controlling means, including comparator means for comparing said direct current signal with a reference signal and for generating a comparison signal controlling said power level controlling means,

a heater circuit for raising the light source temperature to a selected optimum level for proper operation of said atomic frequency resonator,

a sensor for detecting said temperature, and

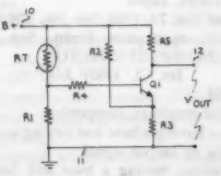
means connected between said heater circuit and said comparator means for increasing said reference signal during the heater warm-up period whereby said power level is increased during said period.

4,456,892

TEMPERATURE COMPENSATING CIRCUIT FOR USE WITH CRYSTAL OSCILLATORS AND THE LIKE

Johannes J. Vandergraaf, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Nov. 12, 1981, Ser. No. 320,424
Int. Cl.³ H03L 1/02
U.S. Cl. 331—176 8 Claims



1. An improved temperature compensating circuit for use with crystal oscillators and the like comprising:

a. first and second voltage source terminals;

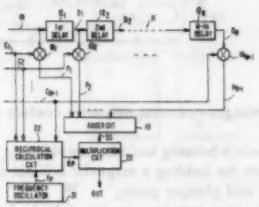
b. a control circuit connected between said first and second source terminals, said control circuit comprising:
1. a thermistor connected between said first source terminal and a first junction;
2. a resistor connected between said first junction and said second source terminal;
3. a resistor connected between said first source terminal and a second junction;
4. a semiconductor device having current electrodes connected between said second junction and a third junction, and having a control electrode;
5. a resistor connected between said third junction and said second source terminal;
6. a direct current path of selected impedance connected between said first junction and said control electrode;
7. a resistor connected between said first source terminal and said third junction;
c. and means for deriving an output from said second junction and one of said source terminals;
d. said thermistor being selected to cause saturation of said semiconductor device at a predetermined temperature and control the output at said second junction as the temperature increases above said predetermined temperature.

4,456,893

EQUALIZER HAVING A SUBSTANTIALLY CONSTANT GAIN AT A PRESELECTED FREQUENCY

Susumu Otani, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Aug. 16, 1982, Ser. No. 408,301
Claims priority, application Japan, Aug. 21, 1981, 56-130239
Int. Cl.³ H04B *3/14*
U.S. Cl. 333—18 **5 Claims**



1. In an equalizer responsive to an input signal having a predetermined frequency band for supplying an output signal to a transmission line with said output signal adjusted to said transmission line, said equalizer comprising delay means for successively delaying said input signal to produce first through N-th delayed signals, control signal generating means for generating first through (N+1)-th gain control signals which define first through (N+1)-th complex tap gains, respectively, and output signal producing means responsive to said input signal, said first through said N-th delayed signals, and said first through said (N+1)-th gain control signals for producing said output signal, the improvement wherein said output signal producing means comprises:

reciprocal signal producing means responsive to preselected ones of said first through said (N+1)-th gain control signals and a frequency specifying signal specifying a preselected frequency in said predetermined frequency band for producing a reciprocal signal representative of a reciprocal of an absolute value of a sum of those complex tap gains, of which said preselected gain control signals are representative at said preselected frequency; and

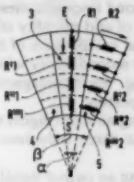
combining means for combining said input signal and said first through said N-th delayed signals with said reciprocal signal and with said first through said (N+1)-th gain control signals, respectively, to produce said output signal.

4,456,894

DISTRIBUTED-CONSTANT RESISTANCE FOR USE AS A HIGH DISSIPATION LOAD AT HYPERFREQUENCIES

Gérard Lapart, Fontenay-sous-Bois, France, assignor to Les Cables de Lyon, Clichy, France

Filed Apr. 15, 1983, Ser. No. 485,364
Claims priority, application France, Apr. 16, 1982, 82 06559
Int. Cl.³ H01P *1/26*
U.S. Cl. 333—22 R **8 Claims**



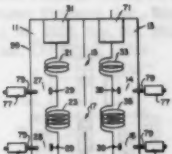
1. A distributed-constant resistance for use as a high dissipation load at hyperfrequencies; said resistance comprising; an insulating substrate having opposed faces, and an edge, a return conductor covering one of said faces, a series resistance layer of low resistivity per unit area on the other of said faces, and at least one parallel resistance layer of high resistivity per unit area connecting a corresponding side of the series resistance layer to a metalized region in contact, via said edge of the substrate, with the return conductor, the improvement wherein the series resistance layer tapers in the form of a sector of a circle from a broad end and having a metal contact connected thereto for receiving input power to a narrow end, and wherein said parallel resistance likewise tapers in the form of a sector of a circle from a broad end to a narrow end, with the series resistance and the paralled resistance being in contact along a common radius and with respective broad ends being adjacent to one another and respective narrow ends being adjacent to one another.

4,456,895

BAND SELECTABLE TUNABLE BANDPASS FILTER

Harvey L. Landt, and Glenn R. Snider, both of Cedar Rapids, Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed May 25, 1982, Ser. No. 381,809
Int. Cl.³ H03H *7/09*; H01P *1/208*
U.S. Cl. 333—174 **2 Claims**



1. A band selectable tunable bandpass filter comprising:

an electrically conductive cavity case having a first cavity and at least one second cavity spaced from and adjacent said first cavity within said cavity case, said cavities being coupled by a plurality of apertures therebetween and said case being coupled to a reference potential;

a first resonator means for resonating at a selectable frequency and including an electrical connection of at least three inductors and a tuning capacitor in series, said series

connection having end terminals coupled to said reference potential and arranged within said first cavity such that each of said inductors is positioned adjacent a different one of said plurality of apertures within said first cavity;

at least one second resonator means for resonating at a selected frequency and including an electrical connection of at least three inductors and a tuning capacitor in series, said series connection having end terminals coupled to said reference potential and arranged within said at least one second cavity such that each of the inductors of said at least one second resonator means is positioned adjacent a different one of said plurality of apertures within said at least one second cavity, each of the inductors in said first and at least one second cavity which are adjacent the same aperture being electro-magnetically coupled solely through that aperture;

means for coupling an input signal to said series connection of said at least three inductors of said first resonator means;

means for coupling an output signal from the series connection of said at least three inductors of said at least one second resonator means; and

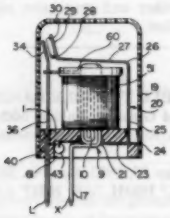
means for selecting a passband of frequencies in said input signal passed by said first resonator means and said at least one second resonator means and including means for providing an electrical short between said reference potential and selected junctions formed by the interconnection of adjacent inductors in the series connection of inductors in said first and second resonator means.

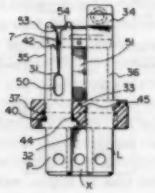
4,456,896

LOW COST RELAY

Rodney Hayden, Stoney Creek, Canada, assignor to TRW Canada Limited, Stoney Creek, Canada

Filed Dec. 30, 1982, Ser. No. 454,895
Int. Cl.³ H01H *50/18*
U.S. Cl. 335—203 **10 Claims**





1. A relay assembly which comprises:

a base and a spool including a central stem;

a unitary core/terminal assembly inserted in said stem having a core portion and a terminal portion;

a yoke/armature assembly secured to said spool and electrically connected to the core/terminal; and

a pair of additional terminals retained in said base in respective slots therein;

said yoke/armature formed from sheet magnetic material and comprising a side section, and an armature section and a bottom section connected respectively to one another at fold lines, a contact surface on said armature section;

a coil on said spool;

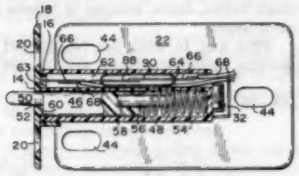
a pair of wires mounted in said spool, respective ends of said coil connected to said wires, one wire being taken through said central stem and engaged by said core portion and effecting direct electric connection to said terminal forming part of said core/terminal, one of said additional terminals being split and receiving the other of said wires and electrically connecting thereto, and said armature contact surface operatively cooperating with the other of said additional terminals for switching connection therewith on energizing and deenergizing of said coil.

4,456,897

PLUNGER-OPERATED SWITCH UNIT

Thomas J. Holce, Portland, and Charles M. Huckins, Tigard, both of Oreg., assignors to Sentrol, Inc., Portland, Oreg.

Filed Jun. 8, 1981, Ser. No. 271,702
The portion of the term of this patent subsequent to Jun. 22, 1999, has been disclaimed.
Int. Cl.³ H01H *36/00*
U.S. Cl. 335—205 **8 Claims**



1. A plunger-operated magnetic contact switch unit, comprising:

(a) a switch housing including an elongate plunger guide and means for holding a magnetic contact reed switch alongside said plunger guide;

(b) a magnet-carrying plunger slidably disposed within said plunger guide;

(c) retaining means included as a part of said switch housing for retaining said switch housing in a predetermined position with said elongate plunger guide extending rearwardly from a surface to which said retaining means may be attached; and

(d) mounting means detachably connectable with said switch housing, for mounting said switch unit on a surface with the length of said elongate plunger guide substantially parallel to said surface.

4,456,898

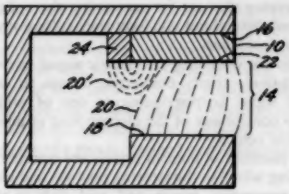
THERMAL COMPENSATORS FOR MAGNETIC CIRCUITS

Peter G. Frischmann, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 11, 1982, Ser. No. 347,831
Int. Cl.³ H01F *1/00*
U.S. Cl. 335—217 **16 Claims**

1. A thermal compensator for use in conjunction with magnetic devices, said thermal compensator comprising a plurality of ferromagnetic metallic alloys in amorphous form, each metallic alloy having a permeability versus temperature response different from that of the other alloys, the individual

alloys being selected such that the plurality exhibits a substantially linear and reversible change in permeability with temperature over substantially the entire operating temperature range of said magnetic devices.



4,456,899

DEVICE AND METHOD FOR UTILIZATION OF HEAT DUE TO LOSSES IN TRANSFORMERS OR CHOKE COILS WHICH ARE INTERNALLY COOLED BY A LIQUID

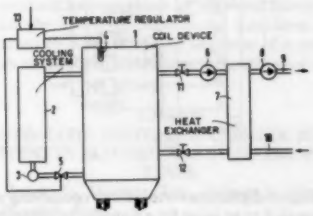
Wolfgang Matthes, Waiblingen-Neustadt, and Heinz Ubl, Stuttgart, both of Fed. Rep. of Germany, assignors to Transformatoren Union AG, Stuttgart, Fed. Rep. of Germany

Filed Jul. 1, 1981, Ser. No. 279,528

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1980, 3025661

Int. Cl.³ H01F *27/08*

U.S. Cl. 336—55 **10 Claims**



1. Method of utilizing heat due to energy loss in a coil device having an interior containing an insulated coil winding cooled by a liquid cooling system, which comprises throttling the cooling system in accordance with an adjusted difference between the temperature of the interior liquid coolant taken at a location under a casing cover of the coil device, and a maximum permissible temperature for a normal useful life of the coil-winding insulation and so that the temperature of the inner coolant is lower when the coil device is under full load than when it is under partial load.

4,456,900

HIGH FREQUENCY COIL

Yohtaro Toyoshima; Yasuhiro Sasaki, and Minoru Uchida, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo and NGK Spark Plug Co., Ltd., Nagoya, both of, Japan

Filed May 6, 1981, Ser. No. 260,986

Claims priority, application Japan, May 23, 1980, 55-71035[U]; Sep. 12, 1980, 55-129119[U]; Mar. 2, 1981, 56-29509[U]

Int. Cl.³ H01F *17/04*

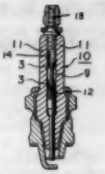
U.S. Cl. 336—221 **7 Claims**

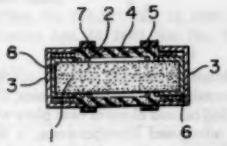
1. An inductive high frequency coil, comprising:

a ferrite magnetic core having a generally cylindrical shape defining opposite ends interconnected by means of a peripheral surface;

a metallic layer plated on said opposite end portions and said peripheral surface adjacent thereto;

a winding wound around said metallic layer plated on said ends and on said peripheral surface to form an inductive device having ends and a peripheral surface;





a pair of end caps fitted on respective ends of said inductive device in contact with said metallic layer and covering at each of said ends a portion of said winding;

a heat resistant electrically insulating layer coated on the peripheral surface of said inductive device; and

a heat resistant electrically insulating resilient tube fitted onto said insulating layer.

4,456,901

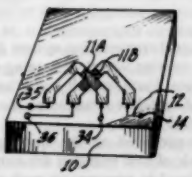
DIELECTRICALLY ISOLATED TRANSDUCER EMPLOYING SINGLE CRYSTAL STRAIN GAGES

Anthony D. Kurtz, Englewood; Timothy A. Nunn, Ridgewood, and Joseph R. Mallon, Franklin Lakes, all of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Aug. 31, 1981, Ser. No. 298,275

Int. Cl.³ G01L *1/22*

U.S. Cl. 338—4 **7 Claims**



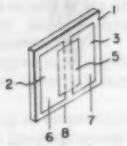
1. A semiconductor pressure transducer comprising;

a layer of single crystal silicon isolated from a substrate layer of single crystal silicon by an intermediate layer of silicon dioxide implanted beneath the top surface of said single crystal layer and at least one single crystal gage configuration formed in said top single crystal layer, whereby said gage is dielectrically isolated from said substrate layer.

4,456,902
GAS AND HUMIDITY SENSING ELEMENT

Yoshiharu Komine, and Takao Sawada, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1983, Ser. No. 475,949
Claims priority, application Japan, Mar. 30, 1982, 57-51826; Mar. 30, 1982, 57-51827; Mar. 30, 1982, 57-51828; Mar. 30, 1982, 57-51854
Int. Cl.³ H01L 7/00; G01N 27/46
U.S. Cl. 338—34 5 Claims

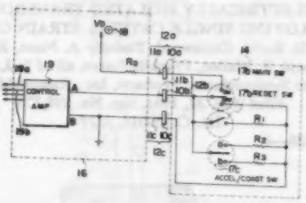


1. A gas and humidity sensing element comprising: an element base plate consisting of apatite ceramics; first and second electrodes provided on said element base plate with said apatite ceramics being interposed therebetween; a third electrode provided on said element base plate with it being separated from said first and second electrodes; and a metal oxide provided between and in contact with said first and third electrodes, said metal oxide being at least one kind selected from the group consisting of tin oxide, zinc oxide, and composite oxide of titanium and niobium.

4,456,903
OPTICAL SIGNAL TRANSMISSION SYSTEM FOR AN AUTOMOTIVE VEHICLE

Norimasa Kishi; Kiyoshi Sasanuma; Yasuhisa Takeuchi, all of Yokosuka, and Shinichi Kato, Fujisawa, all of Japan, assignors to Nissan Motor Company, Ltd., Kanagawa, Japan

Filed Mar. 24, 1981, Ser. No. 247,079
Claims priority, application Japan, Mar. 25, 1980, 55-37759; Mar. 25, 1980, 55-37760; Mar. 25, 1980, 55-37761
Int. Cl.³ B60Q 1/00
U.S. Cl. 340—54 31 Claims



1. An optical signal transmission system for an automotove vehicle having a steering wheel, a steering wheel post, and a plurality of electrical loads, which comprises:

(a) a plurality of switches arranged on the steering wheel to produce control signals;

(b) an encoder provided on the steering wheel and connected to each of said switches for outputting a separate pulse code signal in response to each one of the control signals generated from said switches;

(c) electricity-to-light converting means comprising a single light producing element for converting each pulse code signal from said encoder into an optical signal;

(d) light-transmitting ring made of a solid material with a high light-transmittivity and positioned between the steering wheel and the steering post, receiving the optical signal emitted from said electricity-to-light converting means, and transmitting the optical signal throughout said light-transmitting ring;

(e) light-to-electricity converting means comprising a single light receiving element for converting the optical signal transmitted throughout said light-transmitting ring into an electrical signal; and

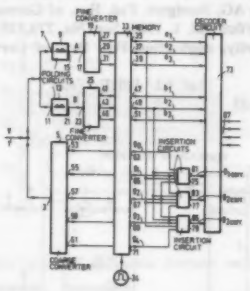
(f) a decoder for decoding the electric signal converted by said light-to-electricity converting means to output an electrical signal corresponding to one of said control signals to control any of the electric load required in the automotive vehicle,

whereby a plurality of control signals are transmitted from the steering wheel to the steering post via said electricity-to-light converting means and said light-to-electricity converting means.

4,456,904
ANALOG-TO-DIGITAL CONVERTER CIRCUIT

Robert E. J. van de Grift, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,363
Claims priority, application Netherlands, Dec. 23, 1980, 8006995
Int. Cl.³ H03K 13/175
U.S. Cl. 340—347 AD 1 Claim



1. An analog-to-digital converter circuit comprising a coarse converter coupled to an input for a signal to be converted, and a first and second folding circuit, respectively, coupled to said input so that the signal to be converted is fed with the same amplitude to an input of each of said folding circuits, a first and second fine converter, respectively, being coupled to an output of said first and second folding circuits, respectively, the first folding circuit having at least one folding level differing from a folding level of the second folding circuit, characterized in that insertion circuit means are coupled to outputs of the coarse converter and to outputs of both of the fine converters for replacing a changing coarse bit information by a changing fine bit information.

4,456,905
METHOD AND APPARATUS FOR ENCODING BINARY DATA

Kentaro Odaka, Kawasaki, Japan, assignor to Sony Corporation, Tokyo, Japan

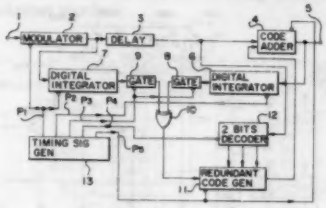
Filed Feb. 8, 1982, Ser. No. 346,915
Claims priority, application Japan, Feb. 9, 1981, 56-17734
Int. Cl.³ H03K 13/24
U.S. Cl. 340—347 DD 2 Claims

2. An apparatus for encoding binary data to produce a sequence of encoded binary digits to be modulated in the NRZI modulation, comprising:

modulating means for encoding the binary data to produce encoded binary digits and arranging said encoded binary digits to form a sequence of binary digit blocks, each of which consists of a plurality of encoded binary digits, with

an interval corresponding to a predetermined number of binary digits between each successive two of said binary digit blocks;

redundant code generating means being able to produce various redundant codes, each of which consists of said predetermined number of binary digits, and providing with one of said various redundant codes, which is to be inserted in said interval in the sequence of binary digit blocks, said one of the various redundant codes being so selected as not to reduce the minimum run length in the waveform of a signal obtained by modulating in the NRZI



modulation said sequence of binary digit blocks with said one of various redundant codes inserted therein in comparison with the minimum run length in the waveform of a signal obtained by modulating in the NRZI modulation the encoded binary digits without the redundant code; and

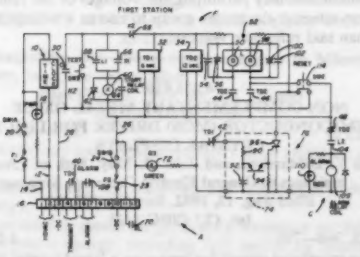
adding means for inserting said one of the various redundant codes in said interval in the sequence of binary digit blocks to produce said sequence of encoded binary digits, by which the DC component in the waveform of a signal obtained by modulating said sequence of encoded binary digits in the NRZI modulation is elminated or diminished.

4,456,906

AUTOMATIC TESTING OF CARRIER RELAY EQUIPMENT IN ELECTRICAL POWER TRANSMISSION LINES

Alva B. Roach, Jr., Houston, Tex., assignor to Houston Industries, Houston, Tex.

Filed Sep. 15, 1981, Ser. No. 302,564
Int. Cl.³ G08B 29/00
U.S. Cl. 340—516 **10 Claims**



1. An apparatus for periodically testing carrier relay equipment in an electrical power transmission and distribution system comprising:

(a) electrical timer means at a first station in the system for periodically starting a test cycle at pre-determined times;

(b) a start relay at the first station responsive to said electrical timer means for forming a starting pulse;

(c) a first time delay relay at the first station for causing a transmitter of the carrier relay equipment of the first station to send a carrier signal over a line of the system to a second station for a predetermined time;

(d) a second time delay relay at the first station for setting a reply time interval within which a reply signal should be received from the second station;

(e) means for detecting a reply signal from the second station;

(f) alarm means for indicating no receipt of a reply signal from the second station within the reply time interval of said second time delay relay; and

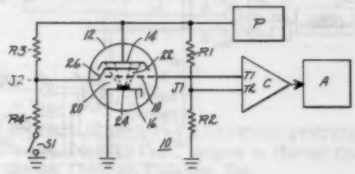
(g) means for disabling said alarm means in the event of receipt of the reply signal from the second station within the reply time interval.

4,456,907

IONIZATION TYPE SMOKE DETECTOR WITH TEST CIRCUIT

Robert E. Johnson, Pembroke, Mass., assignor to Pyrotector, Inc., Hingham, Mass.

Continuation of Ser. No. 224,387, Jan. 12, 1981, abandoned. This application Apr. 26, 1983, Ser. No. 487,356
Int. Cl.³ G08B 17/10
U.S. Cl. 340—629 **12 Claims**



1. An ionization smoke detector comprising

first and second electrodes spaced to define therebetween a smoke detecting chamber, a collector electrode in said smoke detecting chamber between said first and second electrodes,

an ion source positioned for emitting radiation into said smoke detecting chamber for causing ionization of a gas therein,

a power supply connected to said first and second electrodes to establish ion current flow through said smoke detecting chamber,

comparator circuitry connected to said collector electrode, said collector electrode being adapted to apply a predetermined voltage to said comparator circuitry during clean air conditions,

a first voltage divider network connected to said power supply and to said comparator circuitry, said first voltage divider network generating a reference voltage for application to said comparator circuitry, said reference voltage having a predetermined offset value from said clean air voltage applied to said comparator circuitry by said collector electrode, said comparator circuitry being adapted to generate an alarm signal when the voltage applied to said comparator circuitry by said collector electrode is equal to or less than said reference voltage,

a test electrode disposed in said smoke detecting chamber between said first and second electrodes,

a second voltage divider network connected to said power supply circuit and to said test electrode, and

switch means connected to said second voltage divider network, said switch means having open and closed conditions and being connected to said second voltage divider network such that, when said switch means is in open condition, the voltage applied to said test electrode is the same as the voltage applied to said first electrode by said power supply, and when said switch means is in closed condition a test voltage is applied to said test electrode, said test voltage on said test electrode being effective to

reduce the voltage on said collector electrode to a value equal to or less than the said reference voltage to cause said comparator circuit to generate an alarm signal.

4,456,908

REMOTE SWITCH MONITORING CIRCUIT FOR MINING

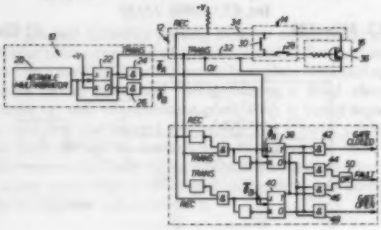
Terence D. Morrell, Beeston, and David A. Straw, Sandiacre, both of England, assignors to Plessey Overseas Limited, Ilford, England

Continuation of Ser. No. 248,708, Mar. 30, 1981, abandoned. This application Aug. 22, 1983, Ser. No. 525,267

Claims priority, application United Kingdom, Mar. 28, 1980, 8010536

Int. Cl.³ G08B 21/00

U.S. Cl. 340—644 8 Claims



1. A monitoring system for a gate remotely located from said monitoring system in a mine for indicating whether said gate is closed, open, or whether a fault exist in the monitoring system, said system comprising:

signalling means for generating a signal;

electrical circuit means and receiving means for conducting and receiving, respectively, electrical signals;

said signalling means generating a signal having a predetermined wave form and transmitting said signal to said electrical circuit means and to said receiving means, said electrical circuit means conducting said signal to said gate and conducting return signals from said gate to said receiving means;

said electrical circuit means also including signal inverting means for inverting said signal and switching means for routing said signal over respective paths;

said inverting means, when energized, producing a first return signal from said gate which is the inverse of said signal received by said gate;

said switching means energizing said inverter when said gate is closed and deenergizing said inverter when said gate is open and producing a second return signal from said gate being the same as said signal from said electrical circuit means when said inverter is deenergized;

said receiving means comprising comparator means and indicating means for respectively comparing said signal and indicating the status of said mine gate and monitoring system;

said comparator means comparing said signal transmitted from said signalling means with said return signals conducted from said electrical circuit means; and

said indicating means indicating when said gate is closed and open when said first and second return signals are received, respectively, and also indicating a fault in said monitoring system when a return signal is not one of said first and second return signals.

4,456,909

METHOD AND CIRCUIT FOR SELECTIVELY DRIVING CAPACITIVE DISPLAY CELLS IN A MATRIX TYPE DISPLAY

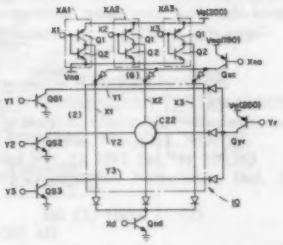
Kazuhiro Takahara, Akashi; Keizo Kurahashi, Kobe, and Hisashi Yamaguchi, Hyogo, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Jun. 29, 1981, Ser. No. 278,715

Claims priority, application Japan, Jun. 30, 1980, 55-89590; Jul. 17, 1980, 55-98291; Aug. 19, 1980, 55-114515

Int. Cl.³ G09G 3/04

U.S. Cl. 340—781 13 Claims



1. A method for driving a matrix type display device for generating an electric-optical display effect in accordance with a display voltage being higher than a non-display voltage which is higher than a reference voltage, comprising a display medium layer, matrix type scanning electrodes and data electrodes, each having a selected and a non-selected state being disposed on opposite sides of and capacitively coupled with said display medium layer, said scanning and data electrodes overlapping and defining capacitive display cells at the overlapping points provide the electric-optical display effect by applying the display voltage of a predetermined level from said both electrodes to the capacitive display cells, said method comprising the steps of:

(a) selecting and applying the reference voltage to at least one of the scanning electrodes;

(b) selecting and applying the display voltage to at least one of the data electrodes;

(c) applying the non-display voltage, which is insufficient for giving the display effect, to an electrode group selected from the non-selected data electrodes and the non-selected scanning electrodes; and

(d) simultaneously permitting the voltages of the remaining non-selected electrodes group to rise to a voltage higher than said reference voltage.

4,456,910

NON-COMPLEMENTARY METAL OXIDE SEMICONDUCTOR (MOS) DRIVER FOR LIQUID CRYSTAL DISPLAYS

Donald V. DiMassimo, and John B. May, both of Liverpool, N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Aug. 12, 1982, Ser. No. 407,402

Int. Cl.³ G09G 3/18

U.S. Cl. 340—784 6 Claims

1. An integrated circuit for operating a liquid crystal display having plural segments operating in conjunction with a common backplane, comprising:

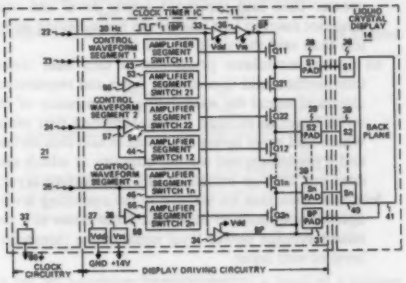
A. a first and a second terminal for connection to a bias supply suitable for field effect transistor (FET) operations, the second terminal being connected to a source bus for application of a supply reference potential (Vss), and the first terminal being connected to a drain bus for application of the supply potential (Vdd);

B. an n-fold plurality of output terminals for connection to individual segments of the display;

C. an output terminal for connection to the backplane of the display;

D. first and second larger capacity FET drivers of like conductivity polarity, each FET driver having an input terminal for connection to a periodic input signal, and an output terminal at which a periodic output appears, alternating between near supply and near reference potentials under load, each FET driver consisting of an output FET having its principal electrodes connected between said driver output terminal and said second supply terminal; and an internal driver load connected between said first supply terminal and said driver output terminal;

E. the output terminal of the first driver being connected to said backplane terminal;



F. means for coupling an alternating signal to the input of said first and second drivers, said last recited signal being coupled to said first driver in a phase inverse to that coupled to said second driver to establish an alternating potential between the output terminals of said drivers;

G. an n-fold plurality of FET segmental switching means having lower capacity than said drivers for activating each segment by disconnecting each segment from said backplane and by connecting each segment to said second driver output terminal; and for inactivating each segment by connecting each segment to said backplane and by disconnecting each segment from said second driver output terminal;

said arrangement minimizing the dc component applied to active display segments and suppressing any ac or dc component applied to inactive display segments.

4,456,911

FREQUENCY MODULATED CONTINUOUS WAVE ALTIMETER

C. F. Augustine, Ann Arbor, Mich., assignor to Microwave Sensors, Inc., Ann Arbor, Mich.

Filed Oct. 20, 1980, Ser. No. 198,600
Int. Cl.³ G01S *13/04*
U.S. Cl. 343—5 PD **12 Claims**

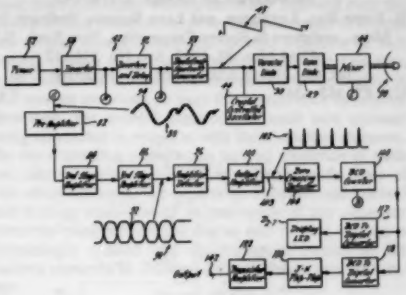
1. A frequency modulated continuous wave altimeter, comprising:

(a) antenna means for receiving and radiating microwave energy;

(b) transmitting means for generating frequency modulated microwave energy, including first oscillating means for generating a carrier signal, modulating means for varying the frequency of said carrier signal, and second oscillator means for impressing a tone on said modulating means;

(c) mixer means, coupled between said antenna means and said transmitting means, for generating a resulting signal from the communication of transmitted and reflected microwave energy;

(d) receiving means for receiving said resulting signal and generating an output signal indicative of distance, and receiving means including amplifier means, tuned to the frequency of said tone, for selectively amplifying said resulting signal, detector means for generating a signal responsive to said selectively amplified resulting signal,



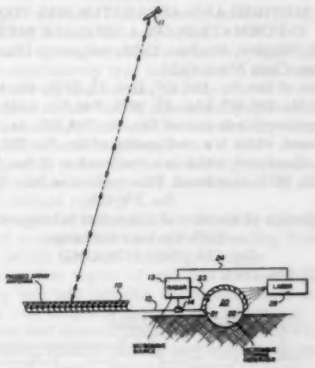
and counting means for generating an output indicative of distance from the number of signals generated from said detector means.

4,456,912

HIGH ENERGY MICROWAVE DEFENSE SYSTEM

Donald L. Ensley, Danville, Calif., assignor to Harvest Queen Mill & Elevator Company, Plainview, Tex.

Filed Apr. 3, 1972, Ser. No. 240,420
Int. Cl.³ G01S *13/86*
U.S. Cl. 343—6 R **9 Claims**



1. A high energy microwave system for directing energy bursts of microwave radiation at a target comprising:

(a) a microwave cavity having superconducting walls for storing microwave energy,

(b) generating means for feeding waves of microwave energy into said cavity,

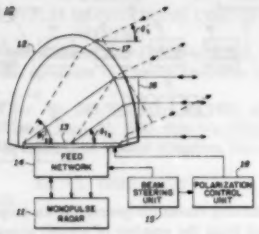
(c) transmitting means coupled to said cavity for directing microwave energy toward said target, and

(d) tracking means connected to said transmitting means for initiating flow of microwave energy to said cavity upon locating said target and triggering said transmitting means a predetermined time after initiating said flow to said cavity for directing a burst of electromagnetic energy to said target.

4,456,913
SUB-ARRAY POLARIZATION CONTROL FOR A MONOPULSE DOME ANTENNA

B. Rama Rao, Lexington, and Leon Susman, Sudbury, both of Mass., assignors to Sperry Corporation, New York, N.Y.

Filed Mar. 31, 1982, Ser. No. 364,143
Int. Cl.³ H01Q 3/00, 21/06, 21/24; H04B 7/10
U.S. Cl. 343—361 5 Claims



1. A method of rendering an antenna system that includes a feed array of elements in energy coupling relationship with a nonplanar lens substantially insensitive to polarization components of received signals that are orthogonal to a predetermined polarization orientation comprising the steps of:

establishing a wave front incident to said non-planar lens, said plane wave front having a linear polarization that is orthogonal to said predetermined polarization orientation;

mapping said linear polarization onto said feed array;

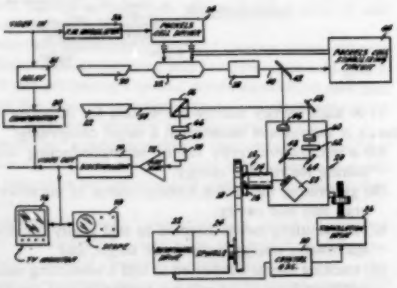
determining polarization orientations at each of said elements resulting from said mapping; and

orientating polarizations of said elements to be orthogonal to said determined polarization orientations.

4,456,914
METHOD AND APPARATUS FOR STORING INFORMATION ON A STORAGE MEDIUM

John S. Winslow, Altadena, Calif., assignor to Discovision Associates, Costa Mesa, Calif.

Division of Ser. No. 106,107, Dec. 21, 1979, which is a division of Ser. No. 890,407, Mar. 27, 1978, Pat. No. 4,225,873, which is a continuation-in-part of Ser. No. 714,133, Aug. 13, 1976, abandoned, which is a continuation of Ser. No. 508,815, Sep. 24, 1974, abandoned, which is a continuation of Ser. No. 333,560, Feb. 20, 1973, abandoned. This application May 10, 1982, Ser. No. 376,454
The portion of the term of this patent subsequent to Sep. 30, 1997, has been disclaimed.
Int. Cl.³ H04N 5/76; G01D 15/14
U.S. Cl. 346—76 L 17 Claims



1. An apparatus for recording an electrical information signal by directing a concentrated high intensity laser light write beam at a recording surface, including means responsive to the electrical signal for controlling the intensity of the laser beam impinging on the recording surface, said apparatus comprising:

an information storage member having a substrate and a thin, light-sensitive surface layer overlying said substrate;

means for moving said storage member in a prescribed fashion;

a laser light source for providing a write beam of light having sufficient intensity to interact with said light-sensitive layer and produce indicia representative of the information signal;

said thin surface layer having a substantially uniform threshold power level;

said threshold power level being of the type wherein said layer reacts to said laser write beam having an intensity greater than said threshold power level and said layer does not react to said laser write beam having an intensity less than said threshold power level;

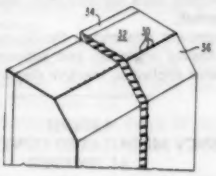
an optical modulator positioned in said laser write beam intermediate said thin surface layer and responsive to the electrical signal for modulating the intensity of the laser write beam to include a predetermined first intensity at which said beam forms an indicia in said thin surface layer and a predetermined second intensity at which said beam does not form an indicia in said thin surface layer; and

feedback apparatus for stabilizing the operating level of said optical modulator to issue said write beam at a predetermined average power level equal to the threshold power level of said layer.

4,456,915
PRINT HEAD FOR HIGH RESOLUTION ELECTROTHERMAL PRINTING APPARATUS

Walter Crooks, Los Gatos; Cameron H. Hafer, San Jose, and William J. Weiche, Los Gatos, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 276,317, Jun. 22, 1981, abandoned. This application Feb. 14, 1983, Ser. No. 466,275
Int. Cl.³ G01D 15/10; H05B 3/00; B41J 3/20
U.S. Cl. 346—76 PH 7 Claims



1. A print head for resistive ribbon printing comprising:

an array of thin wire print electrodes mounted in a single plane, each of said spring electrodes having a size which is sufficiently small as to not be self-supporting and having a contact end for electrically contacting the ribbon during printing;

insulating means extending substantially all the way to said contact end of said print electrodes for resiliently positioning the array of print wire electrodes in a closely-spaced line so that the wires are individually movable out of the planar alignment to a limited extent with respect to other wires in the array to maintain all the print electrodes in contact with the ribbon;

relatively rigid backing means fixed to said insulating means for mounting the array in a relatively fixed position relative to said backing means to enable said non self-supporting print electrodes to withstand a predetermined pressure;

means for mounting said print head in a relatively fixed position relative to said print ribbon; and

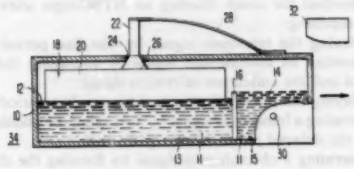
means for selectively applying a predetermined pressure to the print head to produce a predetermined overall pressure between the print head and a print ribbon whereby reliable operation is produced, even though said print electrodes are not self-supporting, due to the support provided by said backing means and the limited movement out of a planar alignment permitted by said insulating means.

4,456,916

INK JET CARTRIDGE WITH HYDROSTATIC CONTROLLER

Raymond H. Kocot, Danbury, Conn., assignor to Burroughs Corporation, Detroit, Mich.

Filed Sep. 28, 1982, Ser. No. 425,232
Int. Cl.³ G01D *15/16*
U.S. Cl. 346—140 R **19 Claims**



1. An ink jet cartridge forming part of a head of a printer mechanism, said head mounted to move transversely back and forth across the width of a recording paper, said ink jet cartridge comprising:

reservoir means for containing an ink supply, said reservoir means divided into first and second compartments;

an ink jet nozzle means mounted to said second compartment;

priming/venting means, movably mounted in said first compartment, for raising the ink level in said second compartment and venting said reservoir means; and

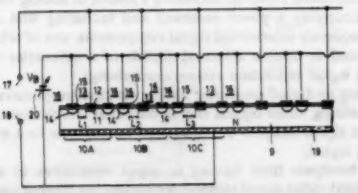
external cam means, mounted on said printer mechanism, said cam means for actuating said priming/venting means as said head moves toward one end of the width of said recording paper.

4,456,917

VARIABLE CAPACITOR

Yasuo Sato, and Takamasa Sakai, both of Tokyo, Japan, assignors to Clarion Co., Ltd., Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,573
Claims priority, application Japan, Dec. 18, 1980, 55-180059
Int. Cl.³ H01L *29/92*
U.S. Cl. 357—14 **9 Claims**



1. A variable capacitor comprising a semiconductor substrate having an ohmic contact thereto and a plurality of variable capacitor elements formed on said substrate, each said element including:

at least one control electrode disposed over the surface of said substrate for controlling the spatial extent of a depletion layer proximate thereto responsively to a control voltage applied thereto; and

at least one capacitance sensing electrode disposed over the surface of said semiconductor surface proximate to at least one of said control electrodes so that variation of said control voltage over a given range causes the depletion layer associated therewith to encroach into the region of said sensing electrode to vary the capacitance associated therewith, the control electrode of each said element being connected in common with those of other elements, the corresponding capacitance sensing electrode of each said element being connected in common with those of said other elements, the separation between said control and sensing electrodes of at least some of the capacitor elements being different so that as said control voltage is increasingly applied said encroachment occurs in the various elements at differing values of said applied voltage.

4,456,918

ISOLATED GATE JFET STRUCTURE

James D. Beasom, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Oct. 6, 1981, Ser. No. 309,194
Int. Cl.³ H01L *29/80, 27/02, 27/04*
U.S. Cl. 357—22 **20 Claims**

1. A thin channel junction field effect transistor comprising:

a semiconductor body having an upper surface;

a bottom gate region of said first conductivity type in said body;

a thin top gate region of said first conductivity type extending from said surface into said body;

a thin channel region of a second conductivity type opposite said first conductivity type contiguous to and extending between said top and bottom gate regions;

a source region of said second conductivity type extending down from said surface and laterally encompassing said top gate and channel regions;

a drain region of said second conductivity type extending from said surface and laterally encompassed by said top gate and channel regions;

an isolation region of said second conductivity type distinct from said source and drain regions extending from said channel regions into said bottom gate region

a top gate contact region of said first conductivity type extending into said isolation region and lateral encompassed at said surface by said top gate region; and

said top gate and channel regions are thin relative to said source, drain, isolation and top gate contact regions..

4,456,919

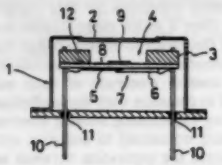
THERMOPILE TYPE DETECTOR WITH TEMPERATURE SENSOR FOR COLD JUNCTION

Katsuhiko Tomita; Tetsuo Shimizu, and Masaichi Bandoh, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Dec. 16, 1981, Ser. No. 331,470
Claims priority, application Japan, Dec. 30, 1980, 55-187506
Int. Cl.³ G01K *1/20*; H01L *23/56, 31/00*
U.S. Cl. 357—28 A **3 Claims**

1. In a thermopile type detector having an electrically insulating film, a thermopile supported on said film, a substrate supporting said film, and a temperature sensing element for sensing the temperature of said substrate on which said film is supported in the neighborhood of a cold junction of said thermopile for use in compensating the output of said thermopile,

the improvement in which said substrate is made of a semiconductor material and a semiconductive temperature response element is mounted on said semiconductor substrate with a



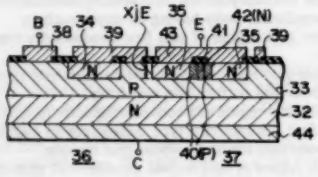
semiconductor junction therebetween and the semiconductor temperature response element and said substrate constituting the temperature sensing element.

4,456,920

SEMICONDUCTOR DEVICE

Susumu Iesaka, Tokyo, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 7, 1980, Ser. No. 194,812
Claims priority, application Japan, Oct. 18, 1979, 54-134390
Int. Cl.³ H01L 27/02
U.S. Cl. 357—46 **10 Claims**



1. In a semiconductor device in which an input stage transistor has a first emitter region and an output stage transistor has a second emitter region, said emitter regions being of a first conductivity type and being formed in adjacent portions of a common base layer of a second conductivity type, and in which a substrate layer of said first conductivity type is contiguous with said common base layer and is provided, on a side opposite said common base layer, with an electrode common to both said input and output stage transistors, the combination comprising:

a first electrode contacting said first emitter region and surrounding said second emitter region;

a second electrode contacting said base layer on a surface thereof adjacent said first emitter region and on a side of said first region away from said second emitter region;

a third electrode contacting said second emitter region;

a first semiconductor region of said second conductivity type formed within and surrounded by said second emitter region and extending along a line perpendicular to the plane of said common base layer through the depth of said second emitter region whereby a portion of said third electrode is separated from said substrate layer by a continuous region of said second conductivity type; and

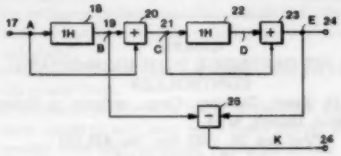
a second semiconductor region of said first conductivity type formed within and surrounded by said first semiconductor region.

4,456,921

COMB FILTERING FOR NTSC TELEVISION SIGNALS

Heinz Hess, Weiterstadt, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Dec. 2, 1981, Ser. No. 326,505
In². Cl.³ H04N 9/535
U.S. Cl. 358—31 **7 Claims**



1. A method for comb filtering an NTSC-type television signal comprising:

(a) delaying the television signal by one line period and generating an intermediate signal by averaging the delayed and the undelayed television signal;

(b) delaying the intermediate signal by one line period and generating a luminance signal by averaging the undelayed and the delayed intermediate signal; and

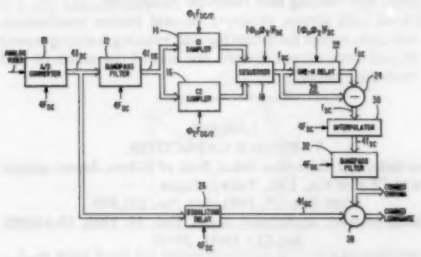
(c) generating a chrominance signal by forming the difference between the television signal delayed by one line period and the luminance signal.

4,456,922

REDUCED DATA RATE COMB FILTER SYSTEM

Alvin R. Balaban, Lebanon, and Steven A. Steckler, Clark, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 4, 1982, Ser. No. 405,171
Int. Cl.³ H04N 9/535
U.S. Cl. 358—31 **11 Claims**



1. In a television receiver, including a source of analog video signals occupying a given passband and including first and second frequency interleaved signal components, one of which is modulated as double sideband signals of a subcarrier frequency, a signal separation system comprising:

an analog to digital converter having an input responsive to said analog video signals and an output at which digitized video signal samples are produced in response to a sampling signal;

a first bandpass filter having an input responsive to said digitized video signal samples for producing filtered signal samples occupying at least that portion of said given passband over which said one interleaved signal component is modulated as a double sideband signal;

a comb filter, including a shift register and a signal combining circuit having inputs coupled to receive selected ones of said filtered signal samples in response to a subsampling clock signal having a frequency which is not greater than

said subcarrier frequency, an output of said shift register being coupled to a second input of said signal combining circuit so as to produce comb filtered signal samples at said subsampling clock signal frequency, said comb filtered signal samples corresponding to one of said frequency interleaved signal components.

4,456,923

COLOR TELEVISION DISPLAY DEVICE COMPRISING A PLURALITY OF PICTURE DISPLAY TUBES

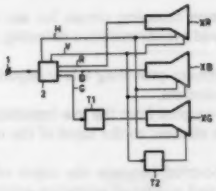
Marcellinus J. J. C. Annegarn, and Werner A. L. Heijnemans, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jun. 3, 1982, Ser. No. 384,825

Claims priority, application Netherlands, May 5, 1981, 8102720

Int. Cl.³ H04N *9/20*

U.S. Cl. 358—64 **9 Claims**



1. In a color television display device comprising a plurality of picture display tubes for displaying a color television signal, each tube having a control electrode for receiving a video signal, a line deflection coil for deflecting in the horizontal direction an electron beam generated in the tube and a field deflection coil for deflecting the electron beam in the vertical direction, the improvement wherein a delay device is provided for delaying by substantially the same delay the vertical deflection of a first group of the display tubes with respect to the vertical deflection of a second group of the display tubes and the video signals applied to the control electrodes of the display tubes of the first group with respect to the video signals applied to the control electrodes of the display tubes of the second group.

4,456,924

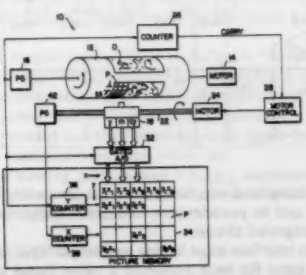
SCREENED IMAGE REPRODUCTION

Gideon Rosenfeld, Tel-Aviv, Israel, assignor to Scitex Corporation Ltd., Herzlia, Israel

Continuation of Ser. No. 139,705, Apr. 14, 1980, Pat. No. 4,350,996. This application May 3, 1982, Ser. No. 374,325

Int. Cl.³ H04N *1/46*

U.S. Cl. 358—75 **6 Claims**



1. The method of producing a screened color reproduction having any selected screen angle comprising the steps of

A. deriving a set of picture values representative of a raster-scanned color original,

B. generating a screen function representing a complete period of a half-tone screen in the form of a grid-like array of grey-tone values, said array being oriented at a reference angle,

C. storing said grey-tone values in a memory at addressable memory locations,

D. scanning and exposing a reproduction member in a raster format in response to exposure signals,

E. generating a succession of said grey-tone value memory addresses,

F. processing each said generated address with a rotated coordinate system transformation to develop a succession of transformed memory addresses,

G. rounding off each said transformed memory address to the nearest actual memory address,

H. addressing the memory using the rounded-off memory addresses to recall said grey-tone values from memory, and

I. comparing the picture values and the recalled grey-tone values to produce said exposure signals for exposing the reproduction member.

4,456,925

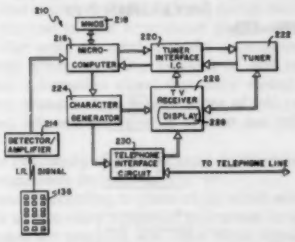
TELEVISION/TELEPHONE SYSTEM WITH AUTOMATIC DIALING

Peter C. Skerlos, Arlington Heights; Thomas J. Zato, Palatine, and Frank C. Templin, Arlington Heights, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 4, 1982, Ser. No. 432,464

Int. Cl.³ H04M *11/08*; H04N *5/00*

U.S. Cl. 358—85 **18 Claims**



1. In a television/telephone system for receiving a transmitted composite video signal having a video component and an audio component in a first mode of operation, said television receiver including a video display, audio signal processing circuitry including audio amplifier-speaker means and a tuner for selectively tuning said television receiver from a currently tuned channel to a desired channel, and for communicating by telephone in a second mode of operation wherein audio communication by means of a telephone line coupled to said television/telephone system may be initiated or responded to with incoming audio signals provided to said audio signal processing circuitry and audio amplifier-speaker means and outgoing audio signals provided to said telephone line by a microphone means responsive to acoustic signals provided thereto, an automatic telephone dialing system comprising:

remotely located mode selection means responsive to user inputs for generating a mode control signal representing said second mode of operation of said television/telephone system;

first remotely located control means responsive to said mode selection means and having a plurality of selectable keys for generating a first plurality of control signals representing channel numbers in said first mode of operation and a second plurality of control signals representing alphanu-

meric telephone number characters in said second mode of operation;

nonvolatile memory means having a plurality of accessible storage locations, each one capable of storing for later recall said channel numbers and said alphanumeric telephone number characters;

signal processing means responsive to said first and second plurality of control signals and coupled to said telephone line, said tuner and said nonvolatile memory means for generating and providing to said nonvolatile memory means for storage therein digitial tune words representing the channel number of a selected channel and digital dialing words representing a selected telephone number in said first and second modes of operation, respectively; and

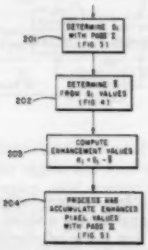
second remotely located control means for generating storage and recall commands and providing said commands to said signal processing means for respectively storing in and recalling from said nonvolatile memory means said digital tune words and said digital dialing words and providing said words respectively to said tuner and said telephone line.

4,456,926

ENHANCEMENT OF FLUROSCOPICALLY GENERATED IMAGES

Robert A. Kruger, Salt Lake City, Utah; Stanley N. Baron, Stamford, Conn., and Ping Y. Liu, Peking, China, assignors to Thomson-CSF Broadcast, Inc., Stamford, Conn.

Filed Jun. 21, 1982, Ser. No. 390,512
Int. Cl.³ H04N 7/18
U.S. Cl. 358—111 **62 Claims**


201
DETERMINE S_i WITH PASS 1 (FIG. 5)
202
DETERMINE $\bar{S}$ FROM S_i VALUES (FIG. 4)
203
COMPUTE ENHANCEMENT VALUES $K_i = S_i - \bar{S}$
204
PROCESS AND ACCUMULATE ENHANCED PIXEL VALUES WITH PASS 2 (FIG. 5)

1. Apparatus for generating a processed video signal representative of an image of a body, comprising:

a source of radiation directable at the body;

means for detecting radiation received from the body;

means for converting the detected radiation into an electronic video signal;

means for storing a series of frames of said video signal as pixel values at respective pixel positions;

means for determining, for each frame, i, of the series, an average pixel value, S_i, for the frame;

means for determining, for each frame, of the series, an enhancement value, k_i, as a function of the average pixel value, S_i, for the frame;

means for combining the pixel values of the pixels of each of the stored frames, i, with the enhancement value k_i for the frame to obtain enhanced pixel values; and

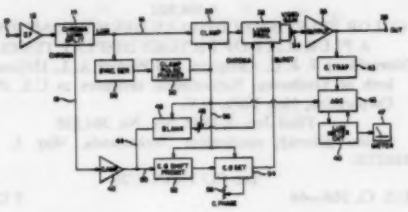
means for combining the enhanced pixel values of corresponding pixels of the frames of the sequence to obtain a processed pixel value at each pixel position.

4,456,927

VIDEO CIRCUITRY

Roger A. Marin, Portland, Oreg., assignor to Vidicraft, Inc., Portland, Oreg.

Filed Dec. 2, 1981, Ser. No. 326,929
Int. Cl.³ H04N 9/535
U.S. Cl. 358—153 **10 Claims**



1. A synchronization detecting circuit for use with a video processing circuit, said synchronization detecting circuit comprising:

an input active element providing a low impedence output,

an output active element,

capacitive means coupled from the low impedence output of the input active element to the input of the output active element,

resistive means coupled between the input of the output active element and a point of reference potential,

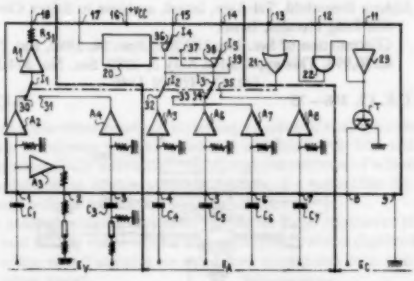
and a positive feedback active element coupling the output of said output active element to the input of said output active element.

4,456,928

INTEGRATED INTERFACE CIRCUIT BETWEEN A TELEVISION RECEIVER AND ITS PERITELEVISION CONNECTOR

Jean C. Guillon; Jean C. Coschieri; Bernard Duret, and Michel Van den Driessche, all of Paris, France, assignors to Thomson-Brandt, Paris, France

PCT No. PCT/FR81/00097, 371 Date Mar. 29, 1982, 102(e) Date Mar. 29, 1982
PCT Filed Aug. 7, 1981, Ser. No. 364,866
Claims priority, application France, Aug. 8, 1980, 80 17534
Int. Cl.³ H04N 5/22
U.S. Cl. 358—181 **10 Claims**



1. An integrated interface circuit for connecting a television receiver and its peritelevision connector comprising within a single integrated circuit;

a video interface stage having an internal input and an external input for each receiving a video signal and a video output, and video switch means connecting said internal input to said output in a first position and said external input to said output in a second position;

an audio interface stage having left and right hand internal video signal inputs and left and right hand external audio signal inputs, left and right hand outputs, first switch means connecting in a first position said right and left internal inputs to said right and left outputs, respectively, and in a second position said right and left external inputs to said right and left outputs, respectively, and a second switch means connecting in a first position a right input to a right output and a left input to a left output and in a second position said left and right inputs to both said left and right outputs;

an external switching stage for controlling said switch means of said video stage and said first switching means responsive to an input for selecting internal or external signals; and

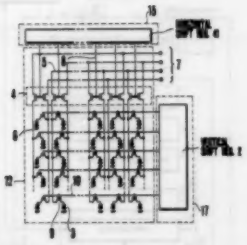
means for controlling said second switching means.

4,456,929

SOLID STATE IMAGE PICK-UP APPARATUS

Masakazu Aoki, Kodaira; Haruhisa Ando, Hachioji; Shinya Ohba, Kanagawa, and Iwao Takemoto, Tokyo, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 4, 1982, Ser. No. 385,005
Claims priority, application Japan, Jun. 5, 1981, 56-85718
Int. Cl.³ H04N 3/15
U.S. Cl. 358—213 6 Claims



1. Solid state image pick-up apparatus comprising:

a first semiconductor layer including a photoelectric conversion element array, and vertical and horizontal switching elements adapted to select said photoelectric conversion elements;

a second semiconductor layer including a horizontal shift register for selecting said horizontal switching elements;

a third semiconductor layer including a vertical shift register for selecting said vertical switching elements;

said first, second and third semiconductor layers being electricaly insulated from each other; and

means for causing gate voltage $V_{SMOS\,L}$ impressed upon a gate electrode of a not selected horizontal switching element to satisfy a relation

$$V_{SMOS\,L} \geq V_{WPD} + V_{FB}$$

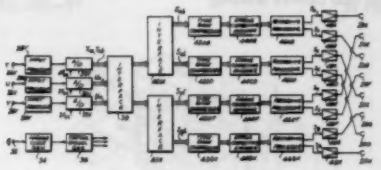
where V_{WPD} represents a potential of said first semiconductor layer, and V_{FB} a flat band voltage beneath gate electrodes of said horizontal switching elements.

4,456,930

METHOD AND APPARATUS FOR RECORDING AND REPRODUCING A DIGITAL INFORMATION SIGNAL

Yoshitaka Hashimoto, Chofu, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 25, 1982, Ser. No. 342,348
Claims priority, application Japan, Jan. 29, 1981, 56-12065
Int. Cl.³ H04N 9/49
U.S. Cl. 358—328 27 Claims



11. Apparatus for recording and reproducing an information signal with respect to a record medium, comprising:

a recording section including:

means for converting said information signal into digital form; and

means for simultaneously recording said digitized information signal in at least three parallel tracks on said record medium without guard bands therebetween and with said digitized information signal in adjacent ones of the tracks being recorded with different azimuth angles; and

a reproducing section including:

means for reproducing said digitized information signal from said at least three parallel tracks;

means for grouping said reproduced digitized information signal into at least two groups, each group including only those portions of said reproduced digitized information signal that were recorded with the same azimuth angle, and each group including portions of said reproduced digitized information signal that were recorded with a different azimuth angle than portions of said reproduced digitized information signal in at least one other group; and

means for processing said reproduced digitized information signal separately for each group.

12. Apparatus according to claim 11; in which said information signal is a color video signal and said means for converting includes means for sampling said color video signal at a frequency which is at least two times the color sub-carrier frequency of the color video signal and analog- to-digital converting means for converting the sampled color video signal into digitized form.

4,456,931

ELECTRONIC CAMERA

Kenji Toyoda, Chigasaki; Takao Watanabe, Koshigaya; Hideya Inoue, Kawasaki; Atsumi Kasuya, Tokyo; Yutaka Ichihara, Yokohama; Akira Miyaji, Tokyo, and Katsumi Mizunoe, Kawasaki, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 29, 1981, Ser. No. 316,666
Claims priority, application Japan, Oct. 31, 1980, 55-153579
Int. Cl.³ H04N 5/76
U.S. Cl. 358—335 20 Claims

13. An electronic still camera of a size suitable to be held in a hand of an operator, comprising:

(a) a camera housing;

(b) optical means arranged in said camera housing and forming an optical image of an object to be photographed on a predetermined surface positioned in said camera housing;

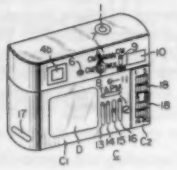
(c) image-sensing means positioned on said predetermined surface for repeatedly converting said optical image at a predetermined cycle into electronic data form and pro-

ducing an electronic image signal expressed as a continuation of said electronic data;

(d) first storing means disposed in said camera housing for recording electronic data corresponding to a still image of said optical image;

(e) second storing means having a plurality of memories each of which records said electronic data corresponding to said still image of said optical image;

(f) display means for visually displaying said optical image, the display means comprising a display monitor arranged on said camera housing;



(g) first control means for recording in said first storing means the electronic data corresponding to the still image out of said electronic image signal, reading out repeatedly the data recorded in said first storing means at a predetermined cycle, transmitting the read out data to said display means and causing said display monitor to display the still image thereon;

(h) second control means for transferring the data in said first storing means to one of the plurality of memories in said second storing means; and

(i) clear means operable by said operator for clearing the data of said first storing means.

4,456,932

HORIZONTAL SKEW ELIMINATION SYSTEM FOR A VTR

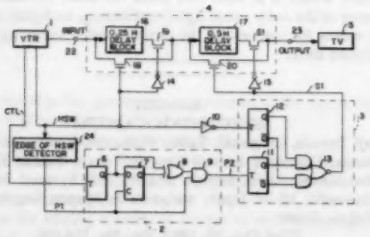
Masahiro Honjo, and Masao Tomita, both of Neyagawa, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Jun. 3, 1981, Ser. No. 270,120

Claims priority, application Japan, Jun. 9, 1980, 55-77529

Int. Cl.³ H04N *5/783*

U.S. Cl. 360—36.1 **5 Claims**



1. A horizontal picture skew elimination system comprising:

a video tape recorder for reproducing video signals recorded on a video track of a video tape and control pulses recorded on a control track of a video tape and for generating a head switch signal;

a delay circuit for delaying said video signals and applying the delayed video signals to a television monitor;

a control pulse detector having said control pulses and said head switch signal supplied thereto for detecting the number of said control pulses appearing during one field which is detected as one half period of said head switch signal and for outputting a count signal corresponding thereto;

a control circuit having said count signal and said head switch signal supplied thereto for producing a delay time selection signal which is supplied to said delay circuit for selecting one of several different predetermined delay times for each field, said control circuit including a memory means for storing said delay time selection signal for one field period, said delay time selection signal being produced in accordance with said head switch signal, said count signal and the delay time selection signal which was produced in a previous field and stored in said memory means, wherein said several different predetermined delay times are respective integer numbers multiplied by 0.25H, wherein H corresponds to a period of a horizontal synchronizing signal;

wherein said control circuit operation is repeated on a field by field basis so as to thereby eliminate horizontal picture skew appearing on said television monitor.

4,456,933

TRANSFERRING DATA BETWEEN MEMORY AND MAGNETIC STORAGE

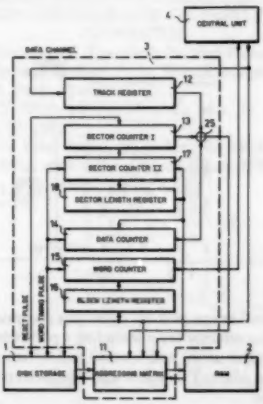
Lutz Schneider, Malsch-Völkersbach, and Bruno Guigas, Bruchsal, both of Fed. Rep. of Germany, assignors to Bruker Analytische Messtechnik GmbH, Rheinstetten-Forchheim, Fed. Rep. of Germany

Filed Dec. 11, 1981, Ser. No. 329,737

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1980, 3047506

Int. Cl.³ G11B *5/09*

U.S. Cl. 360—49 **4 Claims**



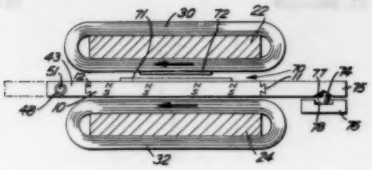
1. A method of transferring data blocks between a random access memory (RAM) and a rotating magnetic memory on which the data are stored in tracks which can be addressed individually, characterized by the fact that the data are divided into blocks, each of which fits to one track of the magnetic memory and such a track is assigned to each data block; the addresses for the individual data in RAM are formed by adding the starting address indicating the beginning of the corresponding data block and the offset indicating the position of the individual data with regard to the starting address; the transfer of a data block starts at an address determined by the position of the magnetic memory when a transfer command occurs and it is performed by cyclic change of the offset according to the number of storage locations belonging to one data block.

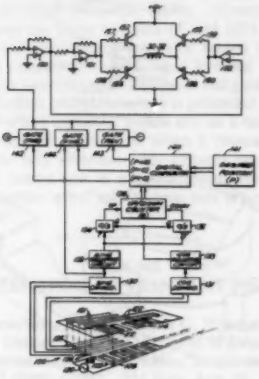
4,456,934

LINEAR POSITIONING SYSTEM

Leonard N. Wedman, Radford, Va., and Joseph A. Bourque, Saratoga, Calif., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Filed May 10, 1982, Ser. No. 376,657
Int. Cl.³ G11B 21/08, 21/10; G05B 11/00; H02K 41/00
U.S. Cl. 360—78 18 Claims





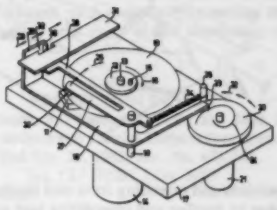
1. A linear positioning system comprising:
a linear magnetic motor including
a U shaped stator core of magnetic material, including parallel legs,
a winding around at least one leg of said core,
a permanent magnet movable parallel to said legs of said core and magnetized transversely so that flux of said magnet interacts with current flow through said winding to produce a force tending to move said magnet;
a position transducer including
a stationary element secured to said core,
a movable element secured to said movable magnet,
and means for producing an actual position signal indicative of the relative positions of said elements; and
a control circuit
responsive to an indication of a desired position for said movable magnet,
responsive to said actual position signal, and
operative to energize said winding with an energizing signal of a polarity for moving said magnet toward said desired position.

4,456,935

INFORMATION RECORDING APPARATUS WITH A DISC LOADED IN A CASSETTE

Marcell Jánosi, Budapest, Hungary, assignor to Budapesti Radiotechnikai Gyar, Hungary

PCT No. PCT/HU80/00001, 371 Date Aug. 7, 1981, 102(e) Date Aug. 7, 1981, PCT Pub. No. WO81/01906, PCT Pub. Date Jul. 9, 1981
PCT Filed Aug. 5, 1980, Ser. No. 293,214
Claims priority, application Hungary, Jul. 29, 1980, 1893/80
Int. Cl.³ G11B 5/82
U.S. Cl. 360—97 24 Claims



1. An information recording apparatus comprising:
a cassette (2) having a lower plate (44), a first and a second long side wall, and a first and a second short side wall, said side walls all connected to said lower plate and defining a record disc space, said lower plate having a drive shaft opening (60) including a first center point and a head opening (61) adjacent a corner of said lower plate where said first long and first short walls meet;
an information record disc (10) having a central hub (12) and plurality of circular information tracts, said record disc rotatably mounted in said record disc space about said first center point (0), said record disc having a diameter and said first center point position so that said record disc is spaced closely from said first and said second long side walls, and said first short side wall, and spaced farther from said second side wall, said tracks positioned to be accessible from said head opening; and
a drive unit (1) couplable with said cassettes and having a drive shaft (13), (15) for engaging with said hub (12), motor means (14) connected to said drive shaft for rotating said drive shaft and record disc in said cassette with said cassette coupled to said drive unit, a head for engaging with one of said information tracks for at least one of recording and reading information, and head moving means for moving said head across said head opening in a curved path having a center of rotation at a second center point adjacent said first long side wall and spaced from said head opening with said cassette coupled with said drive unit so that a relative angle between said head and each track is substantially constant within a small track error throughout said curved path.

4,456,936

CANTILEVERED TRANSDUCER CARRIAGE

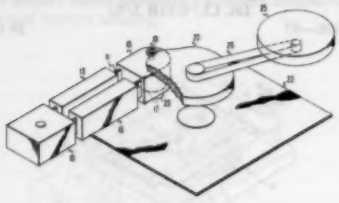
Michael J. Steen, Longmont, Colo., and Michael N. Zell, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 18, 1982, Ser. No. 340,170
Int. Cl.³ G11B 5/48, 21/24
U.S. Cl. 360—104 7 Claims

1. A suspension assembly for a transducer head comprising:
a U-shaped flat spring element having a pair of parallel leg portions with a connecting bit portion;
a head carriage formed adjacent either said spring element bite portion which is remote from the free ends of said parallel leg portions or, alternatively, adjacent the free ends of said parallel leg portions;

a base member formed adjacent the other one of either said spring element bite portion which is remote from the free ends of said parallel leg portions or, alternatively, adjacent the free ends of said parallel leg portions, respectively, such that the none-disabled portions of said spring element parallel leg portions extend with the major surfaces thereof in parallel from said carriage to said base member;

a pair of built-up stiffener sections respectively formed about the central section of each of said spring element parallel



leg portions and extending from said carriage to said base member to confine and immobilize said central portions second of each said spring element parallel leg portions and limit flexure of said spring element parallel leg portions to the non-disabled portions between said stiffener sections and said base member and carriage; and

a transducer carried by said carriage whereby deflection of said carriage and flexing of said spring element parallel leg portions effects parallel translation of said transducer.

4,456,937

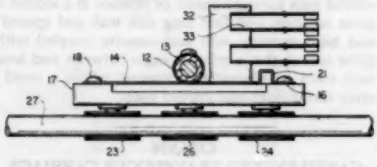
HEAD POSITIONING ASSEMBLY FOR DISC APPARATUS

Syed H. Iftikar, Fremont, and David L. Reeck, San Jose, both of Calif., assignors to Seagate Technology, Scotts Valley, Calif.

Filed May 14, 1981, Ser. No. 263,743

Int. Cl.³ G11B 5/55

U.S. Cl. 360—106 **9 Claims**



1. In positioning apparatus for positioning magnetic heads relative to a recording medium including a carriage adapted to mount said magnetic heads; carriage guide means for linearly guiding said carriage to position said heads relative to said recording medium; linear drive means including a drive motor, a pulley driven by said drive motor and a flexible band means having wrapped engagement with the pulley and end portions attached to said carriage whereby rotation of the pulley imparts linear movement to said carriage, the improvement comprising a hollow pulley made of material having a low coefficient of thermal expansion.

4,456,938

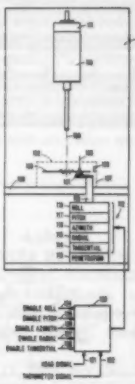
MANUFACTURING APPARATUS FOR ADJUSTING THE POSITION OF A MAGNETIC HEAD IN A FLEXIBLE DISK DRIVE

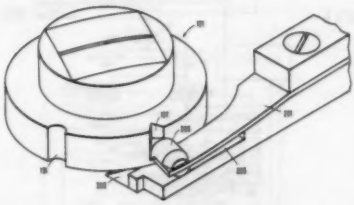
Holger J. Baasch, Rochester, Minn.; Ross W. Bishop, Longmont, Colo.; Paul M. Charlson, Rochester, Minn.; James G. Hunzeker, Boulder, Colo., and Clarence R. Schwieters, Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 12, 1982, Ser. No. 433,618

Int. Cl.³ G11B 5/42, 5/46

U.S. Cl. 360—109 **14 Claims**





1. In a manufacturing apparatus for adjusting the position of a magnetic head while the head is loosely held within or adjacent the head carriage of a flexible disk drive in which the head is to be an integral operating part, and then clamping the head to the carriage after the head is adjusted,

a master data disk rotatable on the disk drive's spindle, so that said disk occupies a known axis and a spin-plane which is normal to said axis, said master disk including an adjustment data track concentric with said axis,

whereupon the intersection of a given fixed-position disk radius and the center of said data track defines a point in space to which the head gap of the disk drive is to be adjusted;

a movable head holder/manipulator initially holding a head in the vicinity of the disk drive's carriage and said point in space; and

motor means operable to move said holder/manipulator in accordance with the data track signal as the data track is read by said head, to thereby position the head relative said data track;

an improved head holder/manipulator comprising:

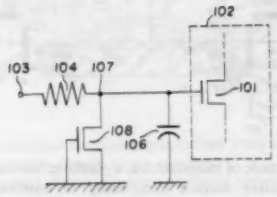
movable head-gripping arms having datum surfaces holding said head at a plane parallel to said spin-plane, and

spring members engaging said head and spring loading said head against said datum surfaces.

4,456,939
INPUT PROTECTIVE CIRCUIT FOR SEMICONDUCTOR DEVICE

Hideyuki Ozaki, and Kazuyasu Fujishima, both of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1981, Ser. No. 261,298
Claims priority, application Japan, Jun. 30, 1980, 55-90117
Int. Cl.³ H02H 3/20
U.S. Cl. 361—56 2 Claims



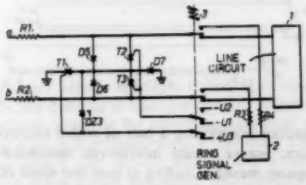
1. An input protective circuit for a MIS type semi-conductor device which is operated by applying reverse bias voltage to the substrate of said semiconductor, comprising:

a MIS field-effect transistor means connected between ground and the input terminal of said MIS type device wherein said field-effect transistor means has its drain electrode connected to said input terminal of said MIS type device and the source electrode and gate electrode of said field-effect transistor means is grounded and wherein said field-effect transistor means acts as a depletion layer device which is conductive when a reverse bias is not applied to said substrate and wherein said field-effect transistor means acts as a enhancement device which is nonconductive when said reverse bias is applied to said substrate.

4,456,940
VOLTAGE CONTROLLED TRANSIENT PROTECTION UNIT

Lars E. Hammerberg, Handen; Royne G. Hjortendal, Sorunda, and Walter Ghisler, Upplands Väsby, all of Sweden, assignors to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden

PCT No. PCT/SE81/00392, 371 Date Aug. 10, 1982, 102(e) Date Aug. 10, 1982, PCT Pub. No. WO82/02287, PCT Pub. Date Jul. 8, 1982
PCT Filed Dec. 23, 1981, Ser. No. 414,330
Claims priority, application Sweden, Dec. 23, 1980, 8009142
Int. Cl.³ H02H 9/04
U.S. Cl. 361—56 4 Claims

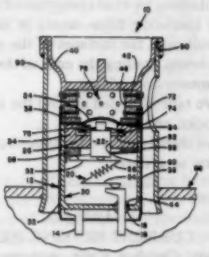


1. Arrangement for protection of a circuit with a supply voltage in a telecommunication equipment against overvoltages appearing on a line connected to the circuit between a terminal and the circuit, on which line in a first operation mode signals representing information are transmitted to and from the circuit and in a second operation mode signalling in the form of alternating voltage is transmitted to the terminal, said arrangement comprising a first and a second current path means connected between the line and a ground terminal, each of said current path means comprising at least one non-linear electronic circuit element, at least one of said non-linear electronic circuit element being controllable, said first current path means being arranged to operate in said first operating mode to short circuit to ground positive overvoltages and said second current path means being arranged to short circuit to ground negative over-voltages, of a magnitude exceeding the magnitude of the supply voltage to said circuit, and whereby in said second operation mode said first current path means is arranged to short circuit to ground positive overvoltages exceeding the positive peak value of said alternating voltage, and said second current path means is arranged to short circuit to earth negative overvoltages, of a magnitude exceeding the magnitude of the negative peak value of said alternating voltage.

4,456,941
PROTECTION DEVICE

Howard H. Fraser, Jr., Lafayette, N.Y., and John J. Jacobs, Flint, Tex., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Sep. 23, 1982, Ser. No. 421,744
Int. Cl.³ H02H 5/04, 5/08
U.S. Cl. 361—105 11 Claims



1. A protection device comprising:

a body defining an interior, an electric lead opening, and port means for conducting fluid between the interior and the exterior of the body;

a first electric lead electrically connected to the body;

a second electric lead extending through the electric lead opening, into the interior of the body;

means electrically insulating the second electric lead from the surfaces of the body defining the electric lead opening;

an electric strip located within the body, having a closed position for conducting electric current between the body and the second electric lead and an open position for electrically separating the body from the second electric lead, and moving from the closed position to the open position when the magnitude of the current conducted through the electric strip exceeds a preset current level;

a plunger movably supported within the body for engaging the electric strip to move the electric strip from the closed position to the open position;

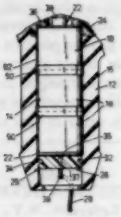
a pressure sensitive snap disc located within the body, having a normal position and an overcenter position, and moving from its normal position to its overcenter position to engage the plunger and move the electric strip from the closed position to the open position when the vapor pressure forces on the pressure sensitive snap disc exceed a preset value; and

a temperature sensitive snap disc located within the body, having a normal position and an overcenter position, and moving from its normal position to its overcenter position to engage the plunger and move the electric strip from the closed position to the open position when the temperature of the temperature sensitive snap disc exceeds a preset value.

4,456,942
GAPLESS ELBOW ARRESTER

Raymond J. Bronikowski, South Milwaukee, Wis., assignor to RTE Corporation, Waukesha, Wis.

Filed Aug. 2, 1978, Ser. No. 930,662
Int. Cl.³ H02H 9/04
U.S. Cl. 361—127 1 Claim

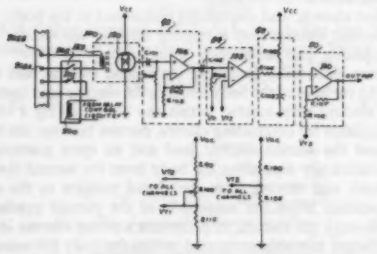


1. A high voltage gapless arrester comprising
an elastomeric housing having a recess at one end,
a number of arrester blocks in said recess,
an electrical connector at each end of said blocks,
means maintaining an axial compressive force on said blocks,
electrically insulating filler means in said recess for filling discontinuities in the surfaces of the arrester blocks,
means for corona grading the ends of the blocks, said corona grading means comprising
a conductive tape wrapped around the junction between the surge blocks, and
a conductive shield on the outside surface of said housing for connection to ground.

4,456,943
CURRENT SENSING RELAY

Murray S. Judy, Carlsbad, Calif., assignor to GA Technologies Inc., San Diego, Calif.

Filed May 24, 1982, Ser. No. 381,047
Int. Cl.³ H02H 3/26
U.S. Cl. 361—160 10 Claims

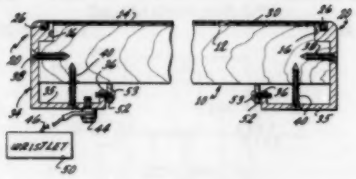


1. An integral relay system comprising:
a relay assembly comprising contacts having open and closed positions for selectively providing an output depending upon whether said contacts are open or closed, and a coil responsive to an input for selectively operating said contacts;
a winding in series with the output from the contacts;
a Hall-effect device proximately located relative to said winding and responsive to the magnetic field produced by the respective winding for providing an electrical output systematically related to said magnetic field; and
processing means responsive to said electrical output of said Hall-effect device for providing an output signal indicative of whether said contacts are open or closed.

4,456,944
TABLE WITH CONDUCTIVE TOP

Jack Rooklyn, Northridge, Calif., assignor to Industrial Management Company, Chatsworth, Calif.

Continuation-in-part of Ser. No. 180,962, Aug. 25, 1980, abandoned. This application Jul. 24, 1981, Ser. No. 286,611
Int. Cl.³ H05F 3/02
U.S. Cl. 361—212 9 Claims

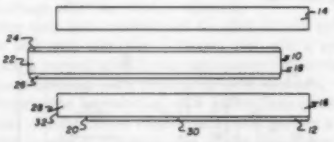


1. As an article of manufacture, a platform having an electrically conductive surface comprising in combination, first means having a generally flat, normally horizontal top area, means providing a smooth continuous electrically conductive surface on said area including a layer of plastic material covering the said surface, metallic means embedded in the plastic material so as to provide electrical conductivity, the said plastic layer having a smooth exposed working surface, the metallic means having exposure to the surface to provide for electrical conductivity of static electricity from a part on the surface through the metallic means, and means for grounding the metallic means whereby to quickly drain off static charge from the platform to protect products placed thereon.

4,456,945
CAPACITOR

Vandos Shedigian, Indianapolis, Ind., assignor to Emhart Industries, Inc., Indianapolis, Ind.

Filed Jul. 1, 1982, Ser. No. 394,289
Int. Cl.³ H01G 1/01, 4/06
U.S. Cl. 361—305 6 Claims



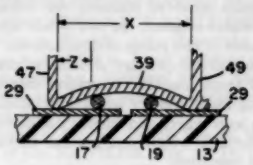
1. A capacitor comprising a pair of rolled electrode sheets and dielectric spacer means interleaved therebetween, said dielectric spacer means including at least one sheet of polypropylene film and at least one sheet of polyethylene teraphthalate film, one of said pair of electrode sheets being a metallized film layer formed on one surface of said polyethylene teraphthalate film and the other of said pair of electrode sheets being a pair of metallized film layers formed on opposite surfaces of a paper sheet, and
a housing carrying said rolled electrode sheets and dielectric spacer means, and electrical terminals electrically connected to said electrode sheets.

4,456,946

SUBMINIATURE ARRAY WITH FLEXIBLE REFLECTOR

Boyd G. Brower, Williamsport, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Nov. 3, 1982, Ser. No. 438,690
Int. Cl.³ G03B 15/02
U.S. Cl. 362—15 14 Claims



1. A miniaturized multilamp photoflash array comprising: a light transmittable plastic cover member;

planar support platform having a printed circuit on the inner surface thereof;

A plastic reflector member positioned within said plastic cover member and affixed to said planar support platform, said reflector member having a plurality of lamp-receiving cavities portions with each cavity portion having a back member with a flexible portion; and

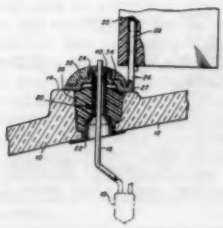
A flashlamp disposed within each of said cavity portions of said reflector member, said flashlamp having a pair of electrical leads passing through said back member of said cavity and positioned intermediate said flexible portion of said reflector and said printed circuit on said inner surface of said planar support platform.

4,456,947

MOTOR VEHICLE HEADLIGHT WITH CONTACT LUG DEFINING ADHESIVE RESERVOIR

Kenneth E. Alexander, Seymour, Ind., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 7, 1982, Ser. No. 385,998
Int. Cl.³ F21V 31/02
U.S. Cl. 362—267 10 Claims



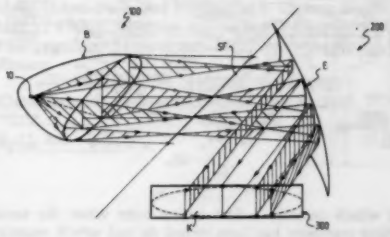
1. In a motor vehicle headlight including an electric lamp, a glass reflector defining at least one opening therein and having a first reflective surface for reflecting light from said electric lamp and a second external surface including a boss portion extending above said second surface and surrounding said opening, a metal eyelet positioned substantially within said opening and including an outer end portion projecting above said boss portion, a quantity of adhesive located within said opening and surrounding said eyelet, an external contact lug having a base portion positioned on said boss portion and including an aperture therein, said outer end portion of said eyelet secured to said base portion of said contact lug, and a lead-in support wire extending through said metal eyelet and said aperture within said base portion of said contact lug for being electrically connected to said electric lamp, the improvement wherein said base portion of said external contact lug includes a peripheral edge portion for resting on said boss portion of said reflector and an elevated portion extending upwardly from said edge portion and having said aperture therein, said base portion defining a reservoir immediately adjacent said opening within sad glass reflector and extending above said boss portion for accommodating excessive amounts of said adhesive which may occur during assembly of said headlight.

4,456,948

MOTOR VEHICLE HEADLAMP WITH A NARROW OUTLET WINDOW

Norbert Brun, Bobigny, France, assignor to Cibie Projecteurs, Bobigny, France

Filed Apr. 12, 1982, Ser. No. 367,777
Claims priority, application France, Apr. 14, 1981, 81 07474
Int. Cl.³ F21V 7/00
U.S. Cl. 362—268 6 Claims



1. A motor vehicle headlamp comprising in combination

(a) an optical system for recovering flux, chosen from the group consisting of elliptical and hyperbolic paraboloids of the fourth degree, said flux recovery system having a rectilinear first focal segment so as to be able to create from a substantially pinhole light source a beam of light rays all passing through the focal segment and all being substantially parallel to the direction of a plane perpendicular to the focal segment, and

(b) an optical system for rectifying images having a second focal segment coinciding with the first focal segment and able to transform the beam leaving the flux recovery system into a beam of rays having controlled directivity passing through a narrow light window.

4,456,949

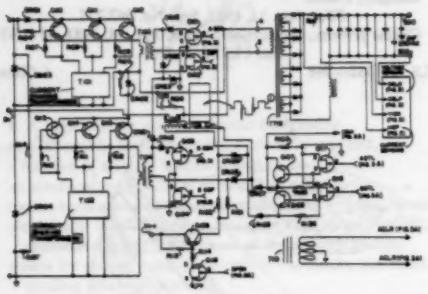
OVERLAP CONTROL SYSTEM FOR PUSH-PULL SWITCHING MODE INVERTER POWER SUPPLY

Stephen H. Incledon, Glendora, Calif., assignor to Pioneer Magnetics, Inc., Santa Monica, Calif.

Filed Jan. 22, 1982, Ser. No. 341,892
Int. Cl.³ H02M 3/335; H02H 7/122
U.S. Cl. 363—26 3 Claims

1. In a push-pull switching mode inverter-type power supply which includes an electomagnetic storage device in the form of a transformer, and which further includes first and second switching transistors connected to said storage device for cyclically storing electrical energy in said storage device and cylically releasing the electrical energy into a load, first switching circuitry connected to said first switching transistor for alternately turning said first switching transistor on and off, and second switching circuitry connected to said second switching transistor for alternately turning said second switching transistor on and off, with each of said first and second switching transistors having a storage time as it is being turned off during which conduction of through currents to the other transistor can occur if the other transistor is turned on before the end of the storage time, an overlap control system for preventing either of the first and second switching transistors

from being turned on until the end of the storage time of the other switching transistor, said control system including: first control circuitry for generating a first switching signal for said first switching circuitry to cause said first switching circuitry to turn said first switching transistor on and off, and second control circuitry for generating a second switching signal for said second switching circuitry to cause said second switching circuitry to turn said second swithcing transistor on and off; signal generating circuitry coupled to said electromagnetic storage device for producing a first indicating signal which assumes a first binary state when the first switching transistor is turned on and which assumes a second binary state at the termination of the storage time after the first switching transistor has been turned off, and for producing a second indicating



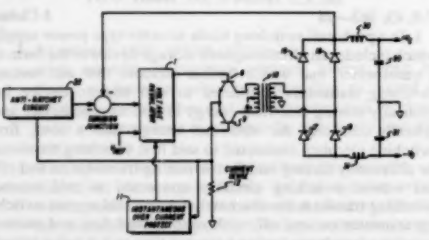
signal which assumes a first binary state when the second switching transistor has been turned on and which assumes a second binary state at the termination of the storage time after which the second swithcing transistor has been turned off; first logic circuitry connected to said signal generating circuitry and to said second control circuitry and responsive to said first indicating signal for preventing said second control circuitry for generating said second switching signal for said second swithcing circuitry until the end of the storage time of the first swithcing transistor; and second logic circuitry connected to said signal generating circuitry and to said first control circuitry and responsive to said second indicating signal for preventing said first control circuitry form generating said first switching signal for said first swithcing circuitry until the end of the storage time of the second switching transistor.

4,456,950

CURRENT SPIKE PROTECTION CIRCUIT FOR SWITCH-MODE POWER SUPPLIES

Clifford B. Cordy, Jr., Corvallis, Oreg., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 10, 1982, Ser. No. 387,054
Int. Cl.³ H02P *13/22*
U.S. Cl. 363—26 **3 Claims**



1. In a power supply having a source of direct current voltage, a transformer having at least one primary and at east one secondary winding, a rectifier connected in series with said secondary winding, an output inductance connected to the output of said rectifier, an output capacitance connected to the output of said inductance, switching means for alternately applying pulses of direct current voltage from said direct current voltage source to said primary winding, and voltage regulating means responsive to the voltage across said output capacitance for varying the percentage of on time of said switching means so as to maintain the voltage across said output capacitance constant, the said power supply being such that one or more of said pulses of direct current voltage causes current to flow in said primary winding so that said primary winding will reach magnetic saturation thereby causing the current through said primary winding to increase in the form of peaks to a level where said current can damage the switching means through which said current flows, wherein the improvement comprises:

means for deriving a signal having an alternating current component, said signal corresponding to the current flowing through said primary winding;

means for detecting the peak of said current signal, said peak detecting means having a time constant such that the peak detected signal can decay prior to the occurrence of a subsequent peak of current through said primary winding; and

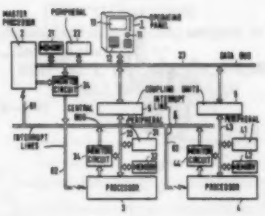
feedback means for selectively coupling the alternating current component of the output of said peak detecting means to said voltage regulating means so as to cause said voltage regulating means to inhibit said switching means as the output of said peak detector increases beyond a predetermined limit.

4,456,951

NUMERICAL MACHINE TOOL CONTROL

Helga Henneberger, Höchstadt; Christian Seeliger, Grossenseebach, and Siegfried Wisser, Erlangen, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Oct. 13, 1981, Ser. No. 310,985
Claims priority, application Fed. Rep. of Germany, Oct. 23, 1980, 3040008
Int. Cl.³ G06F *15/46, 15/16;* G05B *23/02*
U.S. Cl. 364—131 **3 Claims**



1. A numerical machine tool control system of the type having at least two processors, a data bus interconnecting the processors, and an operating panel connected to the data bus for supplying at least one of data and commands, and for interrogation and display of operating states of the control system, the control system further comprising:

an interrupt input in each processor for receiving input data, and an output in each processor for providing signals to be monitored, said input data including at least one pre-set address for at least one of the processors;

a central bus coupled to said interrupt input of each processor; and

a monitor for each processor, each monitor having an input coupled to said output of a respective processor for receiving said signals to be monitored of said respective processor, an input coupled to the data bus for receiving a

pre-set address from the operating panel, and an output for coupling an interrupt signal to said central bus, the monitor generating an interrupt signal when said pre-set address and said signal to be monitored are in agreement.

4,456,952

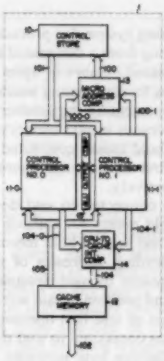
DATA PROCESSING SYSTEM HAVING REDUNDANT CONTROL PROCESSORS FOR FAULT DETECTION

Edward A. Mohrman, Phoenix, Ariz.; Tsunetaka Umeno, and Fumitaka Sato, both of Tokyo, Japan, assignors to Honeywell Information Systems Inc., Waltham, Mass.; Nippon Electric Co., Ltd., Tokyo and Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, both of, Japan

Continuation-in-part of Ser. No. 14,229, Feb. 23, 1979, which is a continuation of Ser. No. 778,616, Mar. 17, 1977, abandoned. This application Nov. 6, 1980, Ser. No. 204,553

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **5 Claims**



1. a partially redundant data processing system comprising:

a control store for storing a microprogram constituted by a plurality of microinstructions;

redundant first and second control processors coupled to said control store for commonly receiving microinstructions from said control store and for simultaneously executing identical data processing under control of said microinstructions, the first and second control processors delivering predetermined microinstructions and memory addresses each time said first and second control processors receive microinstructions from said control store;

microinstruction input means for simultaneously supplying to said first and second control processors microinstructions read out from said control store;

a cache memory for storing a copy of a part of data stored in a main memory;

a first comparator circuit connected to said first and second control processors, for comparing micro-addresses delivered from said first and second control processors to deliver a first non-coincidence signal when the micro-addresses do not coincide with each other;

micro-address output means including a first multiplexer for selecting one of said micro-addresses delivered from said first and second control processors and supplying the selected one micro-address to said control store;

a second comparator circuit connected between said cache memory and said first and second control processors, for comparing memory addresses delivered from said first and second control processors to deliver a second non-coincidence signal when the memory addresses do not coincide with each other;

CPU-to-cache interface means including a second multiplexer for selecting one of said memory addresses delivered from said first and second control processors and supplying the selected one memory address to said cache memory;

data input means for simultaneously supplying data read out from said cache memory to said first and second control processors; and

a fault processing circuit connected to receive the first and second non-coincidence signals of said first and second comparator circuits and connected to said first and second control processors for supplying a clock stop signal to said first and second control processors when a non-coincidence signal is delivered from at least one of said first and second comparator circuits so as to stop temporarily execution of said microinstructions at said first and second control processors.

4,456,953

APPARATUS FOR AND METHOD OF ADDRESSING DATA ELEMENTS IN A TABLE HAVING SEVERAL ENTRIES

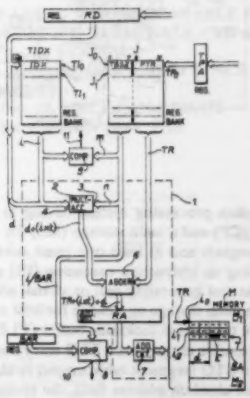
Violette Cohen, Paris, and Philippe L. P. Levieux, Le Chesnay, both of France, assignors to Compagnie Internationale pour l'Informatique CII Honeywell Bull (Societe Anonyme), Paris, France

Filed Dec. 22, 1980, Ser. No. 219,387

Claims priority, application France, Dec. 20, 1979, 79 31287

Int. Cl.³ G06F *9/36*

U.S. Cl. 364—200 **21 Claims**



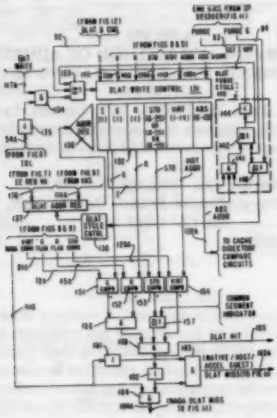
1. A device for addressing data bytes located in entries i in a selected one of plural tables, each having several entries, the bytes being stored in a memory, comprising locator storing means for storing signals representing locators denoting reference entries TR of the selected table and for storing signals having values related to values t for the number of bytes of data stored in each entry of the selected table, different tables having entries with different numbers of bytes so that there are plural values of t, means for storing signals representing the ranks held by entries i containing elements E which are to be addressed with respect to reference entries TR in the selected table, i and t being positive integers, means for addressing element E in response to the signals related to values of the reference entry TR, of the value t, of the rank i and of the value of the position d of element E with respect to the start of the entry containing element E in accordance with the algebraic combination of TR+(i×t), a microprogram word source including bits representing the value of position d, means for coupling at least a portion of the microprogram word as an address signal to the means for addressing element E so element E is addressed in accordance with the algebraic combination of TR+(i×t)+d.

4,456,954

VIRTUAL MACHINE SYSTEM WITH GUEST ARCHITECTURE EMULATION USING HARDWARE TLB'S FOR PLURAL LEVEL ADDRESS TRANSLATIONS

Robert J. Bullions, III; Thomas O. Curlee, III; Peter H. Gum, all of Poughkeepsie; Bruce L. McGilvray, Pleasant Valley, and Ethel L. Richardson, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 15, 1981, Ser. No. 273,532
Int. Cl.³ G06F 9/44, 9/32
U.S. Cl. 364—200 25 Claims



1. In a data processing system having at least one central processor (CP) and a main storage (MS) for supporting a host control program and at least one guest control program, the CP including an instruction execution (IE) unit for executing instructions and generating real or virtual address requests for accesses in main storage or a cache for host or guest programs, a hardware translation lookaside buffer (TLB) having a plurality of addressable entries, each TLB entry containing a validity flag field, a STO (segment table origin) field, a virtual address field and an absolute address field, the system comprising:

mode indicating means in the CP for indicating a host or guest state to respectively indicate whether the host or a guest control program is in control of the CP, each control program having a respective prefix save area (PSA) in main storage containing at least old and new program status words (PSWs) for the respective control program,

a real/virtual flag field in each TLB entry for indicating whether the entry contains a translation of a guest real address or a guest virtual address, whereby the real/virtual flag field indicates whether a valid address translation represented in the entry is for a guest real address or a guest virtual address,

a guest/host indicating means for indicating whether an entry contains a translation for the host control program or the guest control program,

CP storage request control means signalling to the TLB with each guest storage request a real/virtual indicating signal,

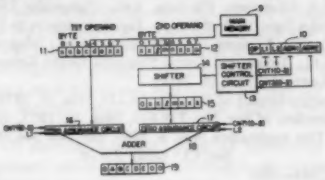
TLB compare circuit control means receiving and comparing the real/virtual indicating signal with a real/virtual flag field in a selected TLB entry and signalling a TLB miss if a non-equal comparison occurs while the mode indicating means is set to guest state.

4,456,955

ALIGNMENT OF ONE OPERAND OF A TWO OPERAND ARITHMETIC UNIT

Tomoatsu Yanagita, Isehara, and Motonobu Nagafuji, Hadano, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 18, 1981, Ser. No. 294,053
Claims priority, application Japan, Aug. 27, 1980, 55-118218
Int. Cl.³ G06F 7/38, 13/00
U.S. Cl. 364—200 3 Claims



1. A data processing system for processing first and second operands each starting from a designated address in a memory and having a designated number of bytes comprising:

designation means for designating leading addresses and the byte lengths representing the number of bytes of said first and second operands in said memory;

first and second hold means connected to said memory for holding said first and second operands read from said memory, respectively;

alignment means connected to said designation means and said second hold means for shifting the second operand supplied from said second hold means by an amount indicated by the leading addresses of the first and second operands designated by said designation means so as to align the operand position of said second operand with the operand position of said first operand;

first control means connected to said designation means for indicating ineffective byte positions in the first operand for arithmetic operation based on the leading address and the byte length of the first operand indicated in said designation means, said first control means including:

(a) first indicating means for indicating the byte position on the left of the left end of said first operand,

(b) second indicating means for indicating the byte position on the right of the right end of said first operand and,

(c) means connected to said first and second indicating means for indicating ineffective byte positions of said first operand for arithmetic operation in response to the indications of said first and second indicating means;

second control means connected to said designation means for indicating ineffective byte positions in the second operand for arithmetic operation based on the leading address of the first operand and the byte length of the second operand indicated by said designation means, said second control means including:

(a) third indicating means for indicating the byte position on the left of the left end of said second operand,

(b) fourth indicating means for indicating the byte position on the right of the right end of said second operand and,

(c) means connected with said third and fourth indicating means for indicating ineffective byte positions in said second operand for arithmetic operation in response to the indications of said third and fourth indicating means;

first gate means connected to said first hold means and said first control means for suppressing the ineffective byte positions of the first operand supplied from said first hold means in response to the indication from said first control means to thereby output the first operand;

second gate means connected to said alignment means and said second control means for suppressing the ineffective byte positions of the second operand supplied from said alignment means in response to the indication from said

second control means to thereby output the second operand; and

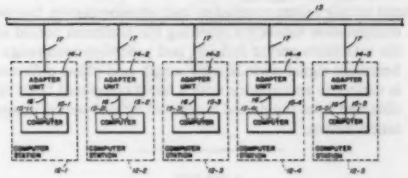
arithmetic operation means connected to said first and second gate means for carrying out an arithmetic operation on the first and second operands supplied from said first and second gate means to produce an output of the result.

4,456,956

METHOD AND APPARATUS FOR CONTROLLING ACCESS OF A NETWORK TRANSMISSION BUS BETWEEN A PLURALITY OF SPACED APART COMPUTER STATIONS

Hussein T. El-Gohary, Harvard; Gary P. Vaillette, Marlboro, and Keith F. Nelson, Chestnut Hill, all of Mass., assignors to Data General Corp., Westboro, Mass.

Filed Aug. 24, 1981, Ser. No. 295,537
Int. Cl.³ G06F *3/04*
U.S. Cl. 364—200 **20 Claims**



1. A computer network comprising network transmission means and a plurality of computer stations coupled to said network transmission means, each of said computer stations being capable of either acting as an independent work station or transmitting information to any one or more of said other computer stations over said network transmission means or receiving information from any one or more of said other computer stations over said network transmission means, each computer station including a computer and an adapter unit, each computer including an interface unit for interfacing with said adapter unit, each adapter unit including an internal bus and circuitry for interfacing with said network transmission means and along with said other adapter units collectively controlling access to said network transmission means, said circuitry comprising:

a. a microcontroller coupled to said internal bus for controlling the operation of said adapter unit,

b. data transfer buffers coupled to said internal bus and said interface unit in said computer for transferring data between said adapter unit and said computer,

c. means coupled to said microcontroller for storing a unique number indicating the address of said adapter unit,

d. scratch pad memory means in said microcontroller for storing a unique number indicating the address of a next adapter unit to which control of the network transmission means is to be passed,

e. a digital phase locked loop and data separator coupled to said network transmission means for separating data received into clock and data signals,

f. a read circuit coupled to the output of said digital phase locked loop and data separator for converting serial data received into parallel data,

g. a write circuit for converting parallel data from said data transfer buffers to serial form for transmission over said network transmission means,

h. means for generating a pass control signal over said network transmission means for passing control to said next adapter unit when said adapter unit wishes to relinquish control,

i. means for generating a signal over said network transmission means indicating that said adapter unit has received control pursuant to a pass control signal,

j. means for generating a request to access signal over said network transmission means to any one of said other adapter units in order to send or receive data when said adapter unit has control of said network transmission means,

k. means responsive to a request to access signal received from any one of said other adapter units for generating a first reply signal for accepting said request if said adapter unit is able to accept said request and responding thereto, and

l. means responsive to a request to access signal received from another adapter unit for generating a second reply signal indicating said adapter unit is unable to accept said request because said data transfer buffers in said adapter unit are full,

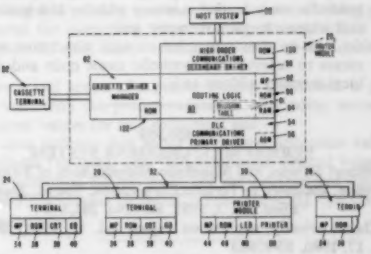
m. said pass control signal generating means responsive to said second reply signal received from any one of said other adapter units for generating a pass control signal over said network transmission means for passing control directly to said adapter unit generating said second reply signal so that said adapter unit generating said second reply signal can unload said data transfer buffers, said pass control signal generating means responsive to the completion of using said network transmission means for unloading said data buffers when control is acquired in response to said second reply signal for generating a pass control signal for passing control back to said adapter unit it received control from so that normal passing sequence can be resumed.

4,456,957

APPARATUS USING A DECISION TABLE FOR ROUTING DATA AMONG TERMINALS AND A HOST SYSTEM

Steven W. Schleitz, Kettering, Ohio, assignor to NCR Corporation, Dayton, Ohio

Filed Sep. 28, 1981, Ser. No. 306,435
Int. Cl.³ G06F *3/04, 9/06*
U.S. Cl. 364—200 **5 Claims**



1. A system comprising:

a host system;

a plurality of terminal units including first terminal units of a first type and other terminal units of at least a second type, said type terminal units having means for also entering routing data into the system and for entering a string of information into the system said routing data including a logical origin address (LOA) which indicates the origin of a said string of information to be routed and a logical destination address (LDA) which indicates the intended destination of said string of information; and

a router module comprising:

first coupling means for coupling said router module with said host system for transferring a said string of information to or from said host system;

second coupling means for coupling said router module with said first type terminal units and said other type terminal units for transferring a said string of information to selected ones of said first type terminal units or said other

type terminal units or for transferring a said string of information from one of said first type terminal units to at least another one of said first type terminal units or said other type terminal units; and

routing logic including a decision table which utilizes said routing data to route said string of information in accordance with said routing data.

4,456,958

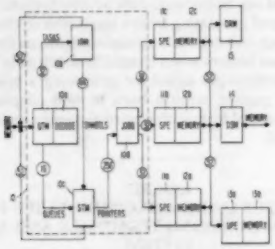
SYSTEM AND METHOD OF RENAMING DATA ITEMS FOR DEPENDENCY FREE CODE

Alfred J. DeSantis, Berwyn, and Joseph S. Schibinger, Phoenixville, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 8, 1982, Ser. No. 386,420

Int. Cl.³ G06F *15/16*

U.S. Cl. 364—200 **10 Claims**



1. In a data processing system having a processor with a local memory and a main memory, the combination comprising:

associative memory means for receiving a main memory address, comparing it to its contents and if that address is not present therein, assigning the code representing a symbolic name to that memory address and transmitting that address to main memory; and

table look-up means coupled to said associative memory means to receive said symbolic name code and assign a local memory address to it.

4,456,959

PERIOD MEASUREMENT SYSTEM

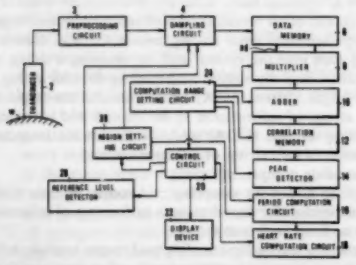
Toshinori Hirano, and Masakazu Murase, both of Fujinomiya, Japan, assignors to Terumo Corporation, Tokyo, Japan

Filed Jul. 7, 1981, Ser. No. 281,162

Claims priority, application Japan, Jul. 17, 1980, 55-97822; Jul. 17, 1980, 55-97823

Int. Cl.³ G06F *15/42*; A01B *5/04*; G01R *23/02*

U.S. Cl. 364—417 **7 Claims**



1. A period measurement system, comprising:

sampling means for sampling a heartbeat signal at a predetermined sampling period and for providing corresponding sampled heartbeat signal data;

autocorrelation function computation means for computing an autocorrelation function over a predetermined range of heartbeat signal periods between a set minimum period and a set maximum period, in response to the sampled heartbeat signal data provided by said sampling means,

period computation means for computing the period of the heartbeat signal from the computed autocorrelation function;

wherein said autocorrelation function computation means operates to compute a function of the sampled heartbeat signal data as obtained at certain times and at a phase difference which is variable with respect to said certain times, said phase difference being variable over a range determined by the set minimum period and the set maximum period of one beat of the heartbeat signal, corresponding to a maximum heart rate and a minimum heart rate, respectively; and

range setting means coupled to said autocorrelation function computation means for resetting the minimum period and the maximum period defining said predetermined range of heartbeat signal periods over which said phase difference is varied, in accordance with a latest computed heart rate obtained from the period computed by said period computation means.

4,456,960

METHOD AND DEVICE FOR DETECTING TOOL ABNORMALITY IN MACHINE TOOLS

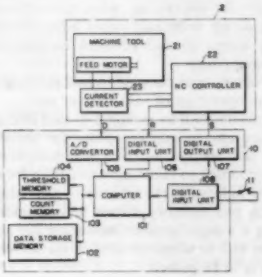
Hideyuki Wakai, Hirakata, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Mar. 25, 1981, Ser. No. 247,233

Claims priority, application Japan, Mar. 27, 1980, 55-39496; Mar. 27, 1980, 55-39497; Mar. 27, 1980, 55-39498; Mar. 27, 1980, 55-39499

Int. Cl.³ G06F *15/46*; G05B *23/02*

U.S. Cl. 364—474 **19 Claims**



19. A method for detecting tool abnormalities in a numerically controlled machine tool of the type which performs a sequence of operations to carry out a machining procedure, and in which tool abnormality detection is carried out only during certain of said operations, comprising:

providing a data set specifying during which operations in said sequence tool abnormality detection is to be carried out,

storing a set of tool abnormality threshold parameters for utilization during respective ones of said operations, and

detecting, during performance of an operation in said sequence for which said data set specifies that tool abnormality detection is to be carried out, the actual tool performance values and comparing these with the stored abnormality threshold parameters for the respective operation; and

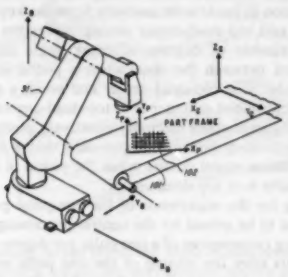
controlling the operation of said machine tool in response to such comparison.

4,456,961

APPARATUS FOR TEACHING AND TRANSFORMING NONCOINCIDENT COORDINATE SYSTEMS

Robert B. Price, Austin, and David L. Jones, Round Rock, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Mar. 5, 1982, Ser. No. 355,077
Int. Cl.[3] B25J 9/00; G06F 15/46
U.S. Cl. 364—513 5 Claims



1. A coordinate system transformation control apparatus for a programmable manipulator having a base referenced by a three dimensional cartesian coordinate system (base frame), actuating means, and end effector, and motive means responsive to the actuating means for causing desired motion of the end effector, comprising:

(a) a hand-held application module for directing the operation of the programmable manipulator, and for selecting a teaching mode;

(b) means, responsive to the teaching mode, for recognizing the point of origin, a point in the X axis and a point in the X-Y plane of at least one other three dimension cartesian coordinate system (user frame 1) as identified by three positions of the end effector;

(c) means for receiving the user frame 1 coordinates and for transforming the user frame 1 coordinates to the base frame coordinates whereby the end effector moves within the user frame in base frame coordinates; and

(d) means for initiating the actuating means to cause the motive means to move the end effector.

4,456,962

TRACER CONTROL SYSTEM

Ryoji Imazeki, and Etsuo Yamazaki, both of Hachioji, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Continuation of Ser. No. 131,791, Mar. 19, 1980, abandoned.
This application Mar. 15, 1982, Ser. No. 358,221
Int. Cl.[3] G06F 15/46; G05B 19/42
U.S. Cl. 364—520 2 Claims

1. A method of performing a series of repeated tracing operations of the surface of a model, with a predetermined corresponding series of desired values for the deflection of the stylus of a tracer head, by calculating the direction and velocity of the tracer head for each tracing operation from signals corresponding to the displacement along respective machine axes of the stylus with respect to the tracer head, from which displacement signals the value of the actual deflection of the stylus is derived, said method comprising

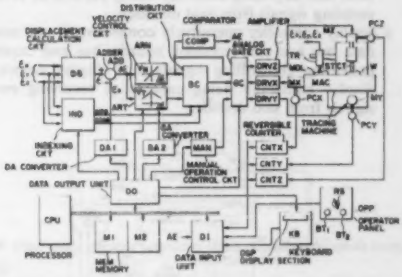
entering data defining said series of repeated tracing operations through an input unit for storage in a memory of said system, said data including data defining said series of desired deflection values corresponding to said series of repeated tracing operations,

selectively reading out the data from the memory by a processor for performing said tracing operation of said repeated series thereof,

inputting said displacement signals to an indexing circuit for supplying direction-of-displacement signals as outputs during each said repeated tracing operation,

determining the actual value of said deflection and outputting the difference between the actual value and the respective predetermined desired deflection value for each said repeated tracing operation, by a difference means provided therefor,

inputting said difference output from said difference means into normal and tangential velocity control circuits, for outputting normal and tangential tracing velocity components with respect to said surface being traced, for reducing said difference between the actual deflection and the respective predetermined desired deflection value during each said repeated tracing operation,



inputting said outputs of the velocity control circuits and said direction-of-displacement signals into a distribution circuit, for outputting velocity command signals for performing each said repeated tracing operation with the respective predetermined desired value for deflection, and

inputting said velocity command signals into an analog gate circuit for outputting respective signals controlling the motion of said tracer head along each of said machine axes,

wherein said series of repeated tracing operations is performed with the predetermined corresponding series of desired values for said deflection, and

said data defining said series of desired deflection values includes the initial and each subsequent desired value of the deflection for the initial and each subsequent tracing operation of said series of repeated tracing operations, respectively.

4,456,963

APPARATUS AND METHOD FOR MEASURING AND DISPLAYING PERFORMANCE CHARACTERISTICS OF RECIPROCATING PISTON MACHINES

Gene D. Wiggins, Arlington, Tex., assignor to S & W Instruments, Inc., Dallas, Tex.

Filed May 11, 1981, Ser. No. 262,761
Int. Cl.[3] G01L 3/00; G06F 15/20
U.S. Cl. 364—551 34 Claims

MICROFICHE APPENDIX INCLUDED
(1 Microfiche, 97 Pages)

1. Apparatus for measuring and displaying indicated power of a reciprocating piston machine, said apparatus comprising:

a common data bus;

a common address bus;

a central processing unit operatively connected to said common data bus and said common address bus;

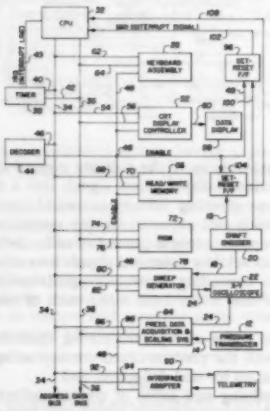
a decoder operatively connected to said address bus for providing enabling signals in response to predetermined addresses being placed on said address bus;

a read-only memory operatively connected to said common data bus and said common address bus and containing instructions for execution by the central processing unit, said read-only memory being capable of receiving enabling signals from said decoder;

a read/write memory operatively connected to said common data bus and said common address bus and being capable of temporary storage of data received from said data bus, said read/write memory being capable of receiving enabling signals from said decoder;

a keyboard assembly operatively connected to said common data bus and said common address bus and providing means for an operator to enter predetermined data onto the data bus for subsequent storage in said read/write memory, said predetermined data comprising connecting rod length, piston stroke and cylinder bore which are used in the calculation of a table of values proportional to the change in cylinder volume per degree of crankshaft rotation, said keyboard assembly being capable of receiving enabling signals from said decoder;

a display controller operatively connected to said common data bus and said common address bus and capable of providing controlling signals to a display device, said display controller being capable of receiving enabling signals from said decoder;



a display device operatively connected to receive said controlling signals from said display controller, said controlling signals being representative of predetermined display information including alphanumeric characters, curves and forms expressing physical or mathematical representations;

means for providing data that represent crankshaft angular position and angular velocity of said reciprocating piston machine to said central processing unit; and

means for providing data that represent cylinder pressure of said reciprocating piston machine to said central processing unit.

31. In apparatus for providing and displaying crank angle and piston position related events of a reciprocating piston machine for the purpose of indicating possible need for preventive maintenance of said reciprocating piston machine and including a common data bus, a common address bus, a decoder, a central processing unit, a read only memory, a read write memory, a keyboard assembly, a display device, a display controller, a sweep generator system, a pressure data acquisition and scaling system, set/reset flip flops and a timer, an improved method of generating an electrical signal which is proportional to the instantaneous position of a piston in a predetermined cylinder with respect to the top-dead-center position in a cylinder, which signal can be used to present an accurate pictorial representation, on a display device, of the instantaneous piston position, comprising the steps of:

entering the values of predetermined mechanical dimensions of a connecting rod and a crankshaft of the reciprocating piston machine on the keyboard assembly and transferring the values to predetermined locations in the read/write memory;

calculating a table of piston position versus crank angle values and storing said values in predetermined locations in a read/write memory located in said sweep generator system;

entering a top-dead-center setting input to a predetermined location in read/write memory from the keyboard assembly, said top-dead-center setting represents the value of the number of degrees of crank angle rotation which occurs between the time when a piston in a reference cylinder is at top-dead-center and when a piston in said predetermined cylinder is at top-dead-center;

adjusting an encoder assembly opeatively positioned on said reciprocating piston machine such that a one pulse per revolution signal occurs when the piston in the reference cylinder is at top-dead-center;

waiting for the occurrence of the one pulse per revolution signal to be sensed by the central processing unit;

counting occurrences of a one pulse per degree signal which occurs after the sensing of the one pulse per revolution signal, said count being performed by the central processing unit under instructions from the read only memory;

outputting a signal from the central processing unit to clear a counter in said sweep generator system when the number of occurrences of the one pulse per degree signal equals the top-dead-center setting;

applying a one pulse per degree signal train to said counter to cause said counter to count one pulse per degree signals;

applying the output of said counter to address inputs of said read/write memory, said output of said counter having a value equal to the count of the one pulse per degree signals applied since said counter was cleared;

changing the output of said read/write memory in accordance with the changing value of the address inputs such that the output of said read/write memory is proportional to the position of the piston in said predetermined cylinder at the crank angle degree which said counter represents;

applying the output of said read/write memory to a digital to analog converter; and

changing the output signal from the digital to analog converter such that said output signal is proportional to the instantaneous position of the piston in a predetermined cylinder with respect to the top-dead-center position of said piston in said predetermined cylinder.

4,456,964

CALCULATOR INCLUDING MEANS FOR DISPLAYING ALPHANUMERIC PROMPTING MESSAGES TO THE OPERATOR

Emil E. Olander Jr., Fort Collins; Rex I. James, Loveland; Ivar W. Larson, Loveland; Wayne F. Covington, Loveland; Jack M. Walden, Loveland; Robert E. Watson, Loveland; Francis J. Yockey, Loveland; Fred Wenninger, Jr., Loveland, and Homer C. Russell, Berthoud, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Division of Ser. No. 051,581, Jun. 25, 1979, Pat. No. 4,281,390, which is a division of Ser. No. 802,323, Jun. 1, 1977, Pat. No. 4,178,633, which is a division of Ser. No. 510,921, Sep. 30, 1974, Pat. No. 4,028,538, which is a division of Ser. No. 212,581, Dec. 27, 1971, Pat. No. 3,839,630. This application Feb. 6, 1981, Ser. No. 232,087

Int. Cl.³ G06F *15/06*

U.S. Cl. 364—710 **5 Claims**

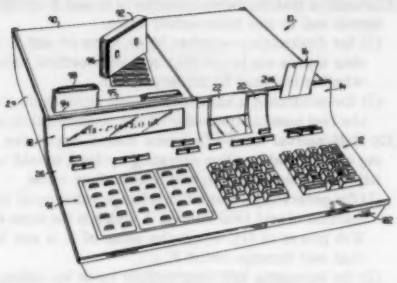
1. An electronic calculator comprising:

keyboard input means, including a plurality of keys, for entering data and other information into the calculator;

memory means for storing one or more programs;

processing means, coupled to said memory means, for processing a program stored in said memory means to perform one or more calculations; and

display means, coupled to said processing means, for visually indicating in conversational language individual types of data to be entered by the user during processing of a program by said processing means;



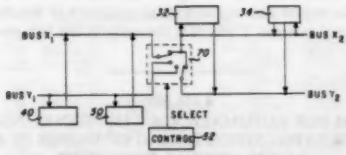
said processing means including logic means responsive to program steps which are encountered during processing of a program stored in said memory means and which call for manual entry of data from said keyboard input means, for controlling said display means to indicate the nature of the data to be entered and thereby prompt the user as to the need for and nature of a data entry at the time such data entry is required during processing of that program.

4,456,965

DATA PROCESSING SYSTEM HAVING MULTIPLE BUSES

Warren S. Graber, St. Joseph, Mich., and Ashok H. Someshwar, Austin, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 14, 1980, Ser. No. 196,892
Int. Cl.³ G06F *13/00, 9/00*
U.S. Cl. 364—900 **5 Claims**



1. A data processing system comprising:

a bus system including first, second, third and fourth N bit buses;

a plurality of logic blocks, at least a said logic block coupled to each one of said first, second, third and fourth buses for data transfer of N bit words;

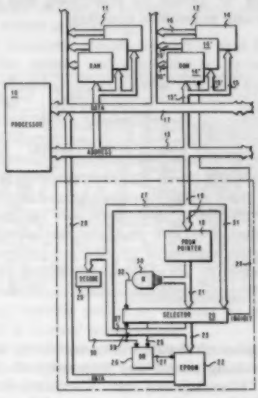
a bus splitting circuit having a first state for coupling said first and second buses together and coupling said third and fourth buses together and having a second state for coupling said first and third buses together and coupling said second and fourth buses together.

4,456,966

MEMORY SYSTEM WITH FLEXIBLE REPLACEMENT UNITS

Charles R. Bringol, and Wilbert L. Kroeger, III, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1981, Ser. No. 238,400
Int. Cl.³ G06B *11/00*
U.S. Cl. 364—900 **6 Claims**



1. A read only memory system with replaceable units comprising:

a fixed main read only memory having a plurality of addressable units of uniform capacity,

substitute memory means having a greater capacity than each of a plurality of said addressable units, and

control means comprising

means for selectively disabling units of said fixed memory comprising

means for monitoring a group of input binary bits associated with each unit of a fixed memory, all of which bits are in the same first of two binary states when a unit is functional and in different binary states when a fixed memory unit is to be disabled,

means for selecting and enabling a portion of said substitute memory having a selected capacity different from the capacity of one of said disabled units,

means for substituting said enabled portion for said one disabled memory unit, and

means for re-enabling any selected disabled unit wherein all of the bits in the group of binary bits associated with said disabled unit are placed in the same unalterable second of said two binary states.

4,456,967

WRITE-ONLY SEQUENCE CONTROLLER

Yoshikazu Kuze, 31-3, Higashimagome 1-chome, Ohta-ku, Tokyo, Japan

Filed Jul. 24, 1981, Ser. No. 286,480
Claims priority, application Japan, Jul. 26, 1980, 55-101874
Int. Cl.³ G06F *13/00*
U.S. Cl. 364—900 **7 Claims**

1. An EPROM programmer in which data in one cycle are divided into data "1" and data "0", comprising

(a) a clock pulse generating circuit for generating clock pulses;

(b) ten-key switches for inputting the number of data "1" and the number of data "0";

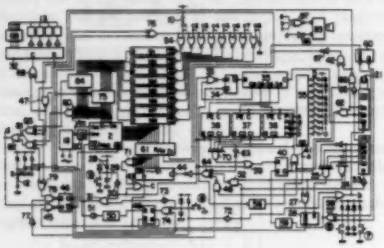
(c) an encoder for converting said numbers data "1" and data "0" in one cycle into binary codes;

(d) presettable counters connected to output terminals of said encoder;

(e) a ring counter for presetting said binary code in said presettable counters and for shifting said binary code in dependency on said clock pulses;

(f) a data "1" switch for said data "1" and a data "0" switch for said data "0";

(g) write clock pulse control gate means connected between said clock pulse generating circuit and said presettable counters and responsive to signals from said data "1" switch data "0" switch for controlling said clock pulses applied to said presettable counters;



(h) R/W pulse control gate means connected to said clock pulse generating circuit and responsive to signals from said data "1" switch and data "0" switch for producing R/W pulses for reading and writing of data;

(i) a binary counter for counting said clock pulses fed to said presettable counters;

(j) memory RAMs connected to address lines of said binary counter for memorizing data therefrom in accordance with said R/W pulses;

(k) a detachably mounted EPROM connected through a connector with outputs of said RAMs for memorizing data stored in said memory RAMS;

(l) circuit means for applying signals to inputs of said counters and gate means for operating thereof.

4,456,968

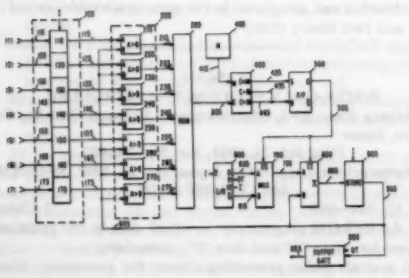
REAL-TIME ORDINAL-VALUE FILTER UTILIZING HALF-INTERVAL RANKING

F. Anthony Carter, Canoga Park, and Jacob M. Sacks, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Sep. 28, 1981, Ser. No. 306,279

Int. Cl.³ G06F *7/06*; G06K *9/00*

U.S. Cl. 364—900 **13 Claims**



1. An apparatus for formulating a signal which approximates the Mth-largest of a set of R applied data signals, where the possible values of said applied signals can extend over a total interval T, and where, for a given set of R signals, said formulation is accomplished through a plurality of iterative operating cycles, with each cycle identified by an iteration count J, said apparatus comprising:

(A) Input storage means, for receiving and storing the subject set of R signals;

(B) Intermediate value storage means, for storing, as an intermediate signal value, the value taken on by said approximating signal during each of said plurality of operating cycles as the signal is being formulated, where at the start of the cyclic operation the intermediate value is initialized at the mid-point value of said total interval T;

(C) Relative ranking means, responsive to said R stored data signals and to said intermediate value,

(1) for determining whether M or more of said R input data signals are larger than said intermediate value, or whether less than M are larger; and

(2) for producing a value-adjustment signal indicative of the two possible outcomes of this determination; and

(D) Half-interval value-adjustment means, responsive, during each of said iterative operating cycles J, to said value-adjustment signal and to said intermediate value,

(1) for generating a magnitude-change value equal to that fraction of said total interval T which is the same as the Kth power of ($\frac{1}{2}$), where the value of K is one larger than said iteration count J;

(2) for increasing said intermediate value by adding said magnitude-change value to said intermediate value when said value-adjustment signal indicates that M or more of said R input signals are greater than said intermediate value; and

(3) for decreasing said intermediate value by subtracting said magnitude-change value from said intermediate value when said value-adjustment signal indicates that less than M of said R input signals are greater than said intermediate value;

(4) for outputting the resulting increased or decreased intermediate value as a magnitude-changed intermediate value;

said intermediate value storage means being responsive to the output of said half-interval value-adjustment means and receiving said magnitude-changed intermediate value as a new intermediate value;

with the Jth operating cycle being completed upon said new-value receipt by said intermediate storage means, and with said apparatus then executing its next operating cycle which begins with said relative ranking means utilizing said new intermediate value to perform said determination and production;

whereby after the completion of a selectable number (N−1) of iterative operating cycles, the intermediate value remaining in said intermediate value storage means approximates the desired Mth-largest data signal with an accuracy of that fraction of said total interval T which is the same as the Nth power of ($\frac{1}{2}$).

4,456,969

SYSTEM FOR AUTOMATICALLY HYPHENATING AND VERIFYING THE SPELLING OF WORDS IN A MULTI-LINGUAL DOCUMENT

Aubrey M. Herzik; Sharon S. Hobbs, both of Austin, and James T. Repass, Round Rock, all of Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 9, 1981, Ser. No. 310,181

Int. Cl.³ G06F *7/28, 15/02, 15/40*; G06K *9/00*

U.S. Cl. 364—900 **8 Claims**

1. An interactive information processing system for detecting erroneous data codes in a stream of data codes comprising:

a processor;

means connected to said processor for storing a plurality of lists of valid data codes of different languages;

means for inserting control signals in said stream of data

codes, each control signal being indicative of the language of the data codes following said control signals;

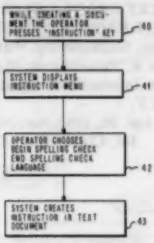
a control program for operating said processor, said control program including,

means operating said processor for detecting said control signals and activating the list of valid data codes of the language indicated by each said control signal;

means operating said processor for comparing the data codes in said stream following each said control signal with said activated list of valid data codes; and

means operating said processor for outputting an indication when the compare is unequal.

5. In an interactive information processing system an improved method for detecting erroneous data codes in a stream of data codes comprising the steps of:


WHILE CREATING A DOCUMENT THE OPERATOR PRESSES "INSTRUCTION" KEY
40
SYSTEM DISPLAYS INSTRUCTION MENU
41
OPERATOR CHOOSES BEGIN SPELLING CHECK END SPELLING CHECK LANGUAGE
42
SYSTEM CREATES INSTRUCTION IN TEXT DOCUMENT
43

(a) storing a plurality of lists of valid data codes of different languages;

(b) inserting in said stream of data codes control signals, each said control signal indicative of the language of the data codes following said control signal;

(c) detecting said control signals and activating the list of valid data codes of the language indicated by each said control signal;

(d) comparing the data codes in said strea.n following each said control signal with said activated list of valid data codes; and

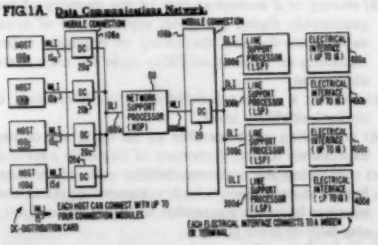
(e) outputting an indication when the compare is unequal.

4,456,970
INTERRUPT SYSTEM FOR PERIPHERAL CONTROLLER

Robert D. Catiller, Garden Grove, and Brian K. Forbes, Huntington Beach, both of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 10, 1981, Ser. No. 329,422
Int. Cl.³ G06F *9/46, 15/16, 3/04*
U.S. Cl. 364—900 **5 Claims**

FIG.1A. Data Communications Network.


MODULE CONNECTION
MODULE CONNECTION
HOST
DC
NETWORK SUPPORT PROCESSOR (NSP)
LINE SUPPORT PROCESSOR (LSP)
ELECTRICAL INTERFACE (UP TO 8)
EACH HOST CAN CONNECT WITH UP TO FOUR CONNECTION MODULES
DC-DISTRIBUTION CARD
EACH ELECTRICAL INTERFACE CONNECTS TO A MODEM OR TERMINAL

1. In a network support processor which operates as a peripheral controller for data transfers between a host computer and a line communications processor connecting data communication lines to remote terminals and wherein said network support processor includes first and second processor-controller means each connected to a shared memory means and said first processor-controller means controls an interface circuit connecting said main host computer and said line communications processor to said network support processor, and wherein said interface circuit and said first processor-controller means operate to control data transfers between said host computer and said line communications processor and wherein said shared memory means temporarily stores data-undergoing-transfer while said second processor-controller means operates to edit and format said data-undergoing-transfer, and wherein said interface circuit and said first processor-controller means include an interrupt circuit means, said interrupt circuit means comprising:

(a) a first processor means, located in said first processor-controller means, and operating to provide command signals to said interface circuit, said first processor means including:

(a1) gating means to generate an interrupt acknowledge signal to an interrupt address register in said interface circuit, said gating means connected to receive an interrupt request signal from a PROM sequencer;

(a2) program counter means to provide addresses for instructions in an internal program PROM;

(a3) said internal program PROM for storing program instructions for delivery to an instruction-decoder;

(a4) said instruction-decoder for executing instructions received from said internal program PROM and for setting bistable means to indicate an interrupt mode signal or normal mode signal;

(a5) said bistable means, actuated by said instruction decoder, for generating said normal mode signal or interrupt mode signal to said gating means;

(a6) said gating means responsive to said interrupt mode signal for inhibiting the generation of said interrupt acknowledge signal to said interrupt address register;

(b) said interface circuit, activated by said first processor-controller means, and providing synchronous communication to said host computer and asynchronous communication to said line communications processor, said interface circuit including:

(b1) said PROM sequencer for generating data transfer instructions for data transfer between said host computer or said line communications processor to/from said shared memory means, said sequencer including:

(b1a) said interrupt request signal to said instruction-decoder of said first processor means for signalling an interrupt when a data transfer sequence is completed by said PROM sequencer, said interrupt request signal being also connected to said gating means;

(b2) a start address register connected to receive address data from said program counter means for initiating an instruction sequence in said PROM sequencer;

(b3) said interrupt address register which is hardwired to place the program address of the interrupt instruction routine into said program counter means upon receipt of said interrupt acknowledge signal from said gating means.

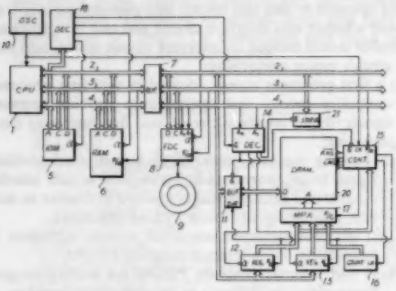
4,456,971
SEMICONDUCTOR RAM THAT IS ACCESSIBLE IN MAGNETIC DISC STORAGE FORMAT

Joji Fukuda, Yokohama, and Yutaka Okubo, Atsugi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Feb. 4, 1982, Ser. No. 345,640
Claims priority, application Japan, Feb. 9, 1981, 56-17742
Int. Cl.³ G06F *13/06*
U.S. Cl. 364—900 **17 Claims**

1. A semiconductor random access memory (RAM) system for use in a processor system that is operable with a magnetic disc storage device and that normally generates track address signals, sector address signals, read/write control signals and enable signals, said semiconductor RAM system comprising a semiconductor RAM having data input/output means and address means for writing data into or reading data out of a

storage location addressed by an address signal supplied to said address means; track address register means for storing a generated track address signal; sector address register means for storing a generated sector address signal; counter means for counting timing pulses to produce a changing count signal; timing control means for generating said timing pulses; and



address synthesizing means coupled to said track address register means, said sector address register means and said counter means for synthesizing a RAM address signal from the stored track and sector address signals and the count signal and for supplying said RAM address signal to said RAM address means to access the RAM storage location addressed thereby.

4,456,972

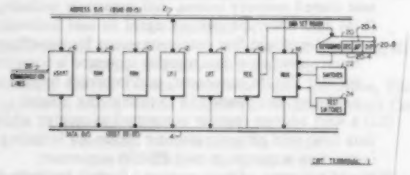
KEYBOARD IDENTIFICATION SEQUENCE

E. Paul Lee, Acton; Frederick H. McCormick, Billerica, both of Mass.; Dennis P. Vietmeier; Neal C. Harrington, both of Freeport, Ill., and Donald R. Clothier, Rockford, Ill., assignors to Honeywell Information Systems Inc., Waltham, Mass.

Filed Feb. 25, 1982, Ser. No. 352,442

Int. Cl.³ G06F *15/02*

U.S. Cl. 364—900 **6 Claims**



1. A computer terminal keyboard of a data processing system having an identity for a particular use and the capability to change to another identity for another use, said computer terminal keyboard comprising:

(a) first means for generating a first portion of a code which identifies a first specific configuration of said computer terminal keyboard;

(b) second means for generating a second portion of the code identifying the first specific configuration of said computer terminal keyboard;

(c) third means responsive to a query electronic signal from a host computer of said data processing system for commencing a series of operations to identify the configuration of said computer terminal keyboard to said host computer;

(d) fourth means coupled to said third means and said first means for comparing said first portion of the code with a predetermined value;

(e) fifth means coupled to said first means, said second means, said third means and said fourth means for combining said first and said second portions of the code into an ID byte when said fourth means indicates that said first portion of the code is equal to the predetermined value;

(f) a keyboard means coupled to said third means, having a plurality of keys; and

(g) sixth means coupled to said third means and said fifth means for storing said ID byte, and wherein said series of operations of said third means further identifies a predetermined set of said plurality of keys as being in an "on" or an "off" position, said ID byte and the position of said predetermined plurality of keys identifying said computer terminal keyboard configuration.

4,456,973

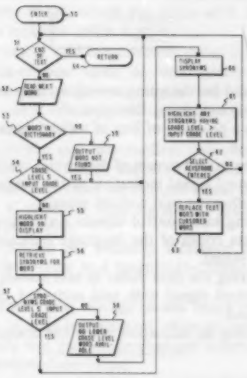
AUTOMATIC TEXT GRADE LEVEL ANALYZER FOR A TEXT PROCESSING SYSTEM

Richard G. Carlgren, Gaithersburg; Walter S. Rosenbaum, Bethesda, and Alan R. Tannenbaum, Washington Grove, all of Md., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1982, Ser. No. 373,544

Int. Cl.³ G06F *15/21*

U.S. Cl. 364—900 **15 Claims**



1. A method for detecting and correcting linguistic expressions which exceed a predetermined understandability level in a list of linguistic expressions using a programmable digital computer system comprising the steps of:

(a) storing in a first section of the memory of said programmable digital computer system a dictionary of linguistic expressions including an understandability code for each linguistic expression;

(b) storing in a second section of the memory of said programmable digital computer system a list of synonymic expressions for said dictionary of linguistic expressions including an understandability code for each synonymic expression;

(c) storing a code representing a predetermined desired understandability level;

(d) comparing each member of an input set of linguistic expressions to said dictionary of linguistic expressions;

(e) comparing the understandability code of the dictionary linguistic expression which compares equal to the input member linguistic expression to the stored desired understandability level code;

(f) highlighting the member of the input set of linguistic expressions when the understandability code of the dictionary linguistic expression is greater than the stored desired understandability level code;

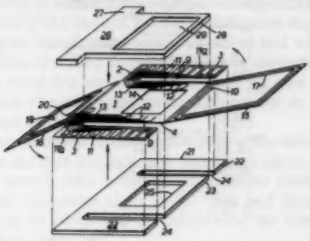
(g) displaying a set of synonymic expressions for the highlighted linguistic expression; and

(h) replacing the highlighted linguistic expression with a member of the displayed set of synonymic expressions.

4,456,974
MAGNETIC BUBBLE DEVICE

Paul V. Cooper, Kingsley, England, assignor to Plessey Overseas Limited, Ilford, England

Continuation of Ser. No. 127,413, Mar. 5, 1980, abandoned. This application Dec. 14, 1981, Ser. No. 330,442
Claims priority, application United Kingdom, Dec. 7, 1979, 7942304
Int. Cl.³ G11C 19/08
U.S. Cl. 365—2 16 Claims

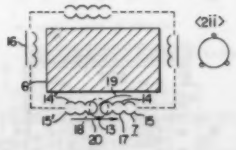


1. A magnetic bubble device comprising:
a chip of material capable of supporting magnetic bubbles, bias means for providing a bias field across the chip, and
a substrate having a chip connection portion provided with electrical connections to the chip from a plurality of electrical terminals and a flap portion provided with a printed Z coil thereon for superimposing a test magnetic field onto the bias field, which flap portion is folded back so as to lie substantially parallel to the substrate.

4,456,975
MAGNETIC BUBBLE MEMORY DEVICE WITH GUARDRAIL

Ryo Suzuki, Kodaira; Naoki Kodama, Hachioji; Tadashi Ikeda, Kodaira, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 4, 1982, Ser. No. 345,678
Claims priority, application Japan, Feb. 6, 1981, 56-15038[U]
Int. Cl.³ G11C 19/08
U.S. Cl. 365—36 6 Claims

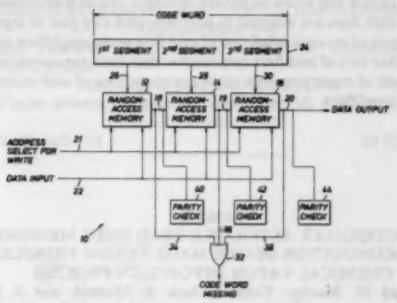


1. A magnetic bubble memory device comprising:
an active magnetic bubble memory region formed by implanting ions into a layer of magnetic bubble material;
a propagation loop having inner and outer propagation tracks formed by ion implantation, so as to surround said region and to propagate captured magnetic bubbles along the circumference of said region;
and
at least one opening portion constituting a merge track and provided at said propagation loop so as to propagate magnetic bubbles in said inner propagation track to said outer propagation track.

4,456,976
ASSOCIATIVE MEMORY SYSTEM

Patric Savage, Brookshire, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 29, 1982, Ser. No. 373,068
Int. Cl.³ G11C 15/00
U.S. Cl. 365—49 4 Claims

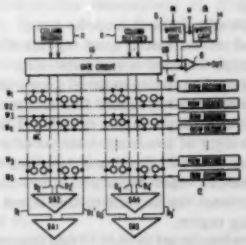


1. An associative memory system for retrieving a key word related to a code word, said memory system comprising: a first random access memory means which can be read from and written into and is sized to accommodate at least m address-bits; a second random access memory means which can be read from and written into and is sized to accommodate at least (n+p) address-bits; and addressing means connected to said first and second memory means for providing a first portion of m bits of said code word, to said fist memory means and a second portion of n bits of said code word to said second memory means, said first memory means being adapted to provide a response word of p bits to said second memory means if said first memory means determines that said first portion of said code word corresponds to a word stored in said first memory means and said second memory means is adapted to provide said key word on an output line if said second memory means determines that a combination of said n and p address-bits corresponds to a word stored in said second memory means.

4,456,977
SEMICONDUCTOR MEMORY DEVICE

Mineo Hayashi, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1981, Ser. No. 243,407
Claims priority, application Japan, Mar. 18, 1980, 55-34443
Int. Cl.³ G11C 11/40
U.S. Cl. 365—51 13 Claims



10. A semiconductor memory device comprising a plurality of data lines arrayed in sequence with a first pitch in a first direction, each of said data lines extending in a second direction normal to said first direction, a plurality of first sense

amplifiers arrayed in sequence with a second pitch in said first direction along first ends of said data lines, said second pitch having a value twice that of said first pitch, a pair of bus lines, gate means disposed near second ends of said data lines and operatively connecting two of said data lines to said pair of bus lines, and a plurality of second sense amplifiers arrayed in sequence with said second pitch in said first direction along an array of said first sense amplifiers, in which two of four consecutive data lines are adapted to be connected to a pair of input terminals of an associated one of said first sense amplifiers and the other two of said four consecutive data lines are connected to a pair of input terminals of an associated one of said second sense amplifiers.

4,456,978

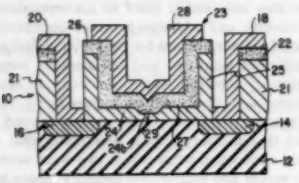
ELECTRICALLY ALTERABLE READ ONLY MEMORY SEMICONDUCTOR DEVICE MADE BY LOW PRESSURE CHEMICAL VAPOR DEPOSITION PROCESS

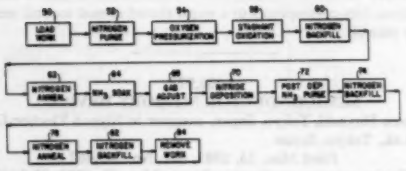
Richard M. Morley, Yonkers; Jagir S. Multani, and J. S. Sandhu, both of Dix Hills, all of N.Y., assignors to General Instrument Corp., Hicksville, N.Y.

Division of Ser. No. 120,741, Feb. 12, 1980, Pat. No. 4,330,930. This application May 25, 1982, Ser. No. 381,704

Int. Cl.³ G11C *11/40*

U.S. Cl. 365—184 **5 Claims**





1. An electrically alterable non-volatile memory device comprising:

a substrate of a first conductivity type;

a first and second spaced apart regions of a second conductivity type disposed in said substrate;

a first layer of insulating material grown on said substrate at low pressure between said first and second regions, said first layer having a region of reduced thickness;

a second layer of insulating material of a higher dielectric constant than said first layer deposited on said first layer by chemical vapor deposition at low pressure, the interface between the first and second layers forming a charge trapping region;

electrodes connected to each of said first and second regions and to said second layer of insulating material, application of potentials to said electrodes moving charges to and from said interface to write into or erase said memory device, whereby the retentivity characteristic of said memory device is improved.

4,456,979

STATIC SEMICONDUCTOR MEMORY DEVICE

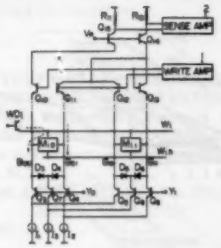
Hideaki Isogai, Higashikurume, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Jan. 27, 1982, Ser. No. 343,155

Claims priority, application Japan, Jan. 29, 1981, 56-11972

Int. Cl.³ G11C *7/02*

U.S. Cl. 365—190 **6 Claims**



1. A static semiconductor memory device operatively connected to receive a column selecting voltage, comprising:

word lines;

bit lines intersecting said word lines;

static memory cells respectively connected to a pair of said word lines and a pair of said bit lines;

a pair of unidirectional current elements connected to each said pair of said bit lines, each of said pair of unidirectional current elements having a first end connected to one of said pair of bit lines so as to absorb the electric current from said bit line, and having a second end;

switching means, operatively connected to said second end of each of said pair of unidirectional current elements, for switching in dependence upon the column selecting voltage; and

a constant current source operatively connected to said switching means.

4,456,980

SEMICONDUCTOR MEMORY DEVICE

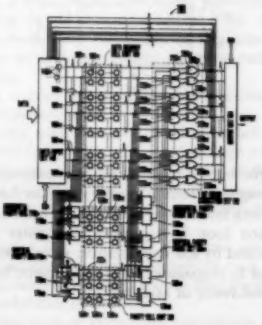
Junzo Yamada, Iruma; Tsuneo Mano, Kodaira, and Junichi Inoue, Chofu, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Mar. 15, 1982, Ser. No. 357,840

Claims priority, application Japan, Mar. 17, 1981, 56-37223

Int. Cl.³ G11C *29/00*; G06F *11/10*

U.S. Cl. 365—200 **7 Claims**



1. A semiconductor memory device comprising:

at least one word line;

a plurality of bit lines extending across said word line;

a data memory cell unit including a plurality of data memory cells connected between said word line and said bit lines for storing information;

a plurality of first extra bit lines corresponding to first groups of the bit lines, each of which group has k bit lines (k is an integer), and extending across said word line;

a plurality of first extra memory cells connected between said word line and said first extra bit lines for storing first checking information with respect to the first groups of the bit lines;

a plurality of second extra bit lines corresponding to second groups of the bit lines, each of which group has m bit lines (m is an integer), and extending across said word line;

a plurality of second extra memory cells connected between said word line and said second extra bit lines for storing second checking information with respect to the second groups of the bit lines;

an error detection circuit for comparing the information fed from the data memory cells with the contents of said first and second extra memory cells to detect errors;

a circuit responsive to an output from said error detection circuit for correcting the information fed from said data memory cells; and

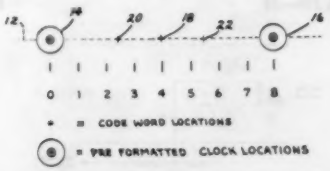
said first extra bit lines being grouped correspondingly to said first gorups of the bit lines, said second extra bit lines being gruped correspondingly to said second groups of the bit lines, each of the second groups of the second extra bit lines being composed of one of the first extra bit lines in each first grup thereof.

4,456,981

MODULATION SYSTEM FOR OPTICAL RECORDING

Derrel R. Silvy, and William J. Stanis, both of Colorado Springs, Colo., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Mar. 19, 1982, Ser. No. 359,642
Int. Cl.³ G11B *7/00, 21/10*
U.S. Cl. 365—234 **1 Claim**



1. A disk shaped record carrier for optical recording comprised of:

a plurality of concentric information tracks each track having a track center line, each track having a plurality of preformatted clock locations prewritten into each of said concentric information tracks at equally spaced intervals,

the record carrier having said preformatted clock locations placed on adjacent concentric information tracks in a predetermined pattern of locations away from the track center line and within a guard band separating tracks to have the concentric tracks present a radial pattern indicative of track crossing patterns as a result of the predetermined pattern of off-center clock locations,

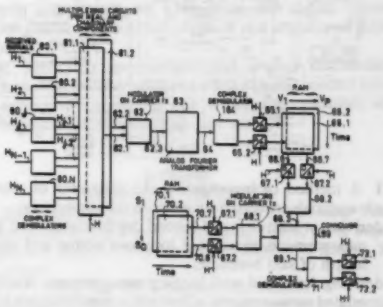
said record carrier being adapted to record information using a selected one or none of a predetermined plurality of three possible writing locations between each pair of clock locations, where the particular location between clock locations is representative of two binary data bits.

4,456,982

IMAGING SYSTEM WITH MULTIPLE, SIMULTANEOUS TRANSMISSIONS

Pierre Tournois, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 8, 1981, Ser. No. 309,772
Claims priority, application France, Oct. 10, 1980, 80 21681
Int. Cl.³ G01S *15/89*
U.S. Cl. 367—11 **23 Claims**



1. An imaging system comprising:

a transmiting array including plural omnidirectional transducers each simultaneously transmitting respective differently coded signals;

a receiving array including plural tranducers each adapted to receive signals transmitted by said transmitting array and reflected off a target, each said receiving array tranducer producing a respective output signal; and

means for processing the output signals produced by said receiving array tranducers, comprising,

means for forming P reception channels and generating respective reception signals $V_1(\theta)$, $V_2(\theta_2)$, . . . $V_k(\theta_k)$, . . . $V_p(\theta_p)$ corresponding respectively to predetermined increments θ_1, θ_2, . . . θ_k, . . . θ_p along a predetermined angular coordinate θ,

means for forming Q transmission channels along a second angular coordinate ϕ and for generating respective signals $S_{l,k}(\phi_l, \theta_k)$ corresponding respectively to predetermined increments ϕ_1, ϕ_2, . . . , ϕ_l . . . ϕ_q along a predetermined angular coordinate ϕ for each of said reception channels, wherein the signals $S_{l,k}(\phi_l, \theta_k)$ are the sum in amplitude and phase of the coded signals transmitted by said transmitting array in the direction referenced by angular coordinates ϕ_l and θ_k,

means for performing matched filtering of each of said signals $V_k(\theta_k)$ with a respective set of said signals $S_{l,k}(\phi_l, \theta_k)$ and for producing respective output signals, and

means for forming P×Q image points based on the output signals produced by said matched filtering performing means.

4,456,983

SYSTEM AND METHOD FOR VISUAL DISPLAY OF WELL LOGGING DATA

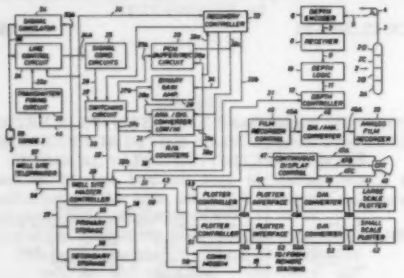
Larry G. Schoonover, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Continuation of Ser. No. 84,401, Oct. 12, 1979, Pat. No. 4,352,166, which is a continuation-in-part of Ser. No. 949,592, Oct. 10, 1978, abandoned. This application Jan. 13, 1982, Ser. No. 339,210

The portion of the term of this patent subsequent to Sep. 28, 1999, has been disclaimed.

Int. Cl.³ G01V *1/40*

U.S. Cl. 367—69 9 Claims



1. A method of investigating the character of subsurface earth materials traversed by a borehole, comprising:

deriving at least first and second depth-related well logging measurements at selected locations within and along the length of said borehole,

deriving from said well logging measurements functionally related measurements of first and second selected lithological characteristics of said materials traversed by said borehole at said selected locations,

sequentially storing said measurement of said first and second lithological characteristics,

generating and storing a first sequential bit pattern corresponding to said first lithological characteristic,

generating and storing a second sequential bit pattern corresponding to said second lithological characteristic,

generating a preselected two-dimensional lithological bit pattern matrix corresponding to a preselected relationship between said first and second lithological characteristics,

storing said bit pattern matrix,

retrieving said first and second bit patterns and at at least a portion of said bit pattern matrix, and

displaying a visible and recordable representation of said first and second bit patterns corresponding to said lithological measurements of said materials together with a correlative indication of the depth of said locations along said borehole and said at least a portion of said bit pattern matrix in the area between said first and second bit patterns.

4,456,984

MAGNETIC PICK-UP AND/OR CUTTER CARTRIDGE

Keimpe Van Wijk, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

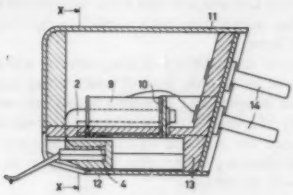
Filed Dec. 22, 1981, Ser. No. 333,362

Claims priority, application Netherlands, Jan. 30, 1981, 8100448

Int. Cl.³ G11B *3/00*; H04R *11/12*

U.S. Cl. 369—170 7 Claims

1. A magnetic cartridge for information in a track of a disc-shaped record carrier, comprising a stylus holder which carries a stylus at one end and is attached to an omnidirectionally pivotal movable element at its other end; two electric coils; two magnetic circuits, one for each of two mutually perpendicular directions of pivotal oscillation, which magnetic circuits each comprise at least one polepiece, each polepiece cooperating with said pivotal element, each circuit extending from the pivotal element to a respective electric coil; and means for producing a respective magnetic flux in each circuit corresponding to the pivotal oscillations, characterized in that each magnetic circuit comprises a hollow magnetic conductor



having a length, elongated in the direction of the magnetic flux, the hollow conductor defining at least one cavity which extends substantially in the direction of the magnetic flux, and each magnetic conductor has at least one slot which communicates with the respective cavity and extends the length of the conductor substantially in the direction of the magnetic flux.

4,456,985

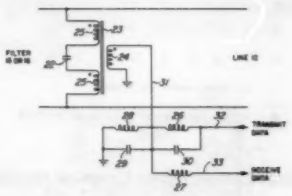
APPARATUS FOR COUPLING SIGNALS TO OR FROM A TWO-WIRE LINE

Ralph T. Carsten, Nepean; Michael S. Nakhla, Ottawa, and Charles B. D. Bunner, Carp, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 23, 1981, Ser. No. 333,664

Int. Cl.³ H04B *1/50*

U.S. Cl. 370—30 17 Claims



1. Apparatus comprising:

a transformer having at least one first winding and at least one second winding;

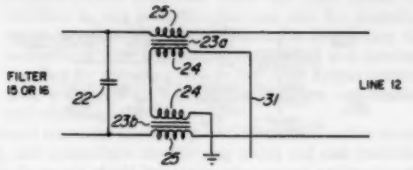
a filter having a predetermined pass band for coupling signals in the pass band to or from a two-wire line, the filter including a shunt capacitor coupled in series with the at least one second winding across the two-wire line; and

an inductor coupled in series with the at least one first winding and forming with the capacitor, as reflected through the transformer, a series resonant circuit having a predetermined resonance frequency outside the pass band, whereby signals substantially at the predetermined resonance frequency are coupled to or from the two-wire line via the inductor and the transformer.

4,456,986
APPARATUS FOR COUPLING SIGNALS TO OR FROM A TWO-WIRE LINE

Ralph T. Carsten, Nepean; Michael S. Nakhla, Ottawa, and Charles B. D. Bunner, Carp, all of Canada, assignors to Northern Telecom Limited, Montreal, Canada

Filed Dec. 23, 1981, Ser. No. 333,666
Int. Cl.³ H04B 1/50
U.S. Cl. 370—30 8 Claims



1. Apparatus comprising:

a transformer having at least one first winding and at least one second winding;

a filter having a predetermined pass band for coupling signals in the pass band to or from a two-wire line, the filter including a shunt capacitor coupled in series with the at least one second winding across the two-wire line; and

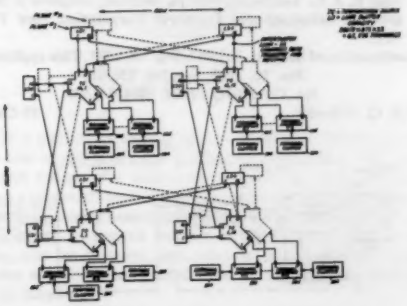
means, coupled in parallel with the at least one first winding, having a relatively low impedance at frequencies in the pass band and a relatively high impedance at frequencies outside the pass band of the filter;

whereby signals at said frequencies outside the pass band of the filter can be coupled to or from the two-wire line via the transformer.

4,456,987
DIGITAL SWITCHING NETWORK

Howard L. Wirsing, Schaumburg, Ill., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Mar. 22, 1982, Ser. No. 360,734
Int. Cl.³ H04Q 11/04
U.S. Cl. 370—58 20 Claims



1. A switching network for selectively interconnecting a plurality of digital terminals by transmission paths through said network comprising:

in at least one plane including

MN switching means arranged in M rows and N columns orthogonally related to each other, where M and N are even integers, each of said MN switching means having a first plurality of ports coupled to a plurality of digital terminals, a second plurality of ports each associated with a different one of said M rows and a third plurality of ports each associated with a different one of said N columns, said first, second and third plurality of ports being interconnected internally of each of said MN switching means;

first intermediate switching devices associated with said M rows, wherein a plurality of said intermediate switching devices are associated with each row, each having a fourth plurality of ports such that one of said ports is associated with each of the second plurality of ports of each of said MN switching means in each row;

second intermediate switching devices associated with said N columns, wherein a plurality of said intermediate switching devices are associated with each column, each having a fourth plurality of ports such that one of said ports is associated with each of the third plurality of ports of each of said MN switching means in each column;

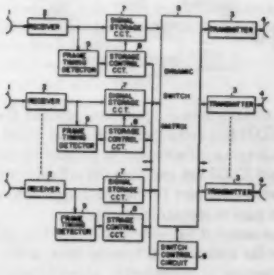
each of said first, second, third, and fourth plurality of ports having two oppositely directed external unidirectional paths coupled thereto, each of said unidirectional paths having a plurality of channels transmitted thereon in a time division format, each of said plurality of channels carrying digital information and digital control information for a different one of said plurality of terminals;

said MN, first intermediate and second intermediate switching means, being responsive to said control information originating at one terminal to establish said transmission path through said network.

4,456,988
SATELLITE REPEATER

Yukio Nakagome, Yokohama; Akira Ogawa, Machida; Yasuo Hirata, Mitaka, and Toshio Takahashi, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 27, 1982, Ser. No. 343,181
Claims priority, application Japan, Jan. 29, 1981, 56-10886; Jan. 29, 1981, 56-10887
Int. Cl.³ H04B 7/185; H04J 1/02
U.S. Cl. 370—75 5 Claims



1. A satellite repeater for a digital satellite communication system for use on board of a satellite comprising:

receiving antennas for receiving radio-frequency signals sent from a plurality of ground stations in said digital satellite communication system;

receivers connected respectively to corresponding receiving antennas;

a signal processing circuit for switching signals received by said receivers in synchronism with stable clock timings;

transmitters receptive of switched outputs of the signal processing circuit to provide transmitting radio-frequency signals;

transmitting antennas connected respectively to the transmitters to transmit the transmitting radio-frequency signals;

receiving timing detectors respectively connected to receive

the outputs of the receivers for detecting the frame timings of the output signals of the receivers;

signal storage circuits provided between respective outputs of the receivers and the signal processing circuit for storing respectively the output signal of the receivers by respective desired amounts; and

control means operatively connected to the receiving timing detectors, the signal storage circuits and the signal processing circuit for controlling the storage operations of the signal storage circuits so that each of the frame timings of the received signals and the switching timing of the signal processing circuit bear a desired timing relationship.

4,456,989

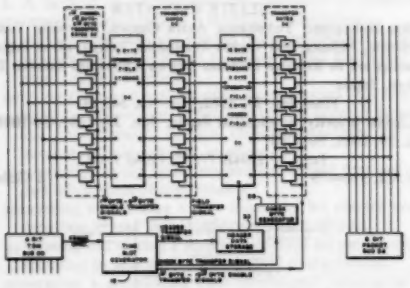
SIGNAL TRANSFORMATION APPARATUS

Alfred O. Johnson, 12603 Little Stones La.; Donald E. Rogness, 358 Linden Ct., both of Herndon, Va. 22070, and George W. White, 1523 Cameron Crescent Dr., Reston, Va. 22090

Filed Aug. 5, 1982, Ser. No. 405,471

Int. Cl.³ H04J *6/00*

U.S. Cl. 370—94 **7 Claims**



1. Signal transformation apparatus adapted for connection between a TDM bus and a packet bus, said TDM bus and said packet bus carrying information in parallel byte form in time sequence, said TDM bus carrying (n) different voice channels in time division multiplex format, said apparatus comprising:

TDM and packet storage elements;

first means coupled between said TDM bus and said TDM element for transferring, byte by byte, a first plurality of bytes disposed in immediately adjacent time sequence on one selected channel from said TDM bus to said TDM element for storage as an information field therein;

second means coupled between said TDM element and said packet element for transferring, byte by byte, said information field from said TDM element to said packet element for storage therein;

third means coupled to said packet element for transferring a second plurality of bytes to said packet element for storage therein as a header field in combination with the stored information field, the header field uniquely identifying said selected channel;

fourth means coupled between said packet element and said packet bus for transferring the fields stored in the element, byte by byte, from said packet element onto the packet bus and,

fifth means for adding a check byte to said stored fields before the transfer onto the packet bus is completed.

4,456,990

PERIODIC WAVE ELIMINATION BY NEGATIVE FEEDBACK

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec, Canada (H3H 1T1), and Sidney T. Fisher, 53 Morrison Ave., Montreal, Quebec, Canada H3R 1K3

Filed Feb. 10, 1982, Ser. No. 347,517

Int. Cl.³ H04J *15/00*

U.S. Cl. 370—119 **3 Claims**

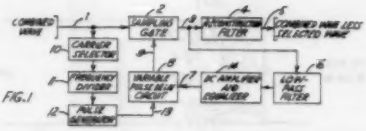


FIG. 1

1. The method of receiving a band-limited combined wave, comprising a selected periodic wave of a selected frequency, and other waves, and delivering said combined wave substantially free from said selected periodic wave, which comprises:

sampling said combined wave for short periods centered on instants of zero-crossings of said selected periodic wave, with a gating frequency equal to the frequency of said selected periodic wave divided by an integer, and greater than the Nyquist frequency of said combined wave, and

reconstructing the samples produced by said sampling to produce a direct current due to any incorrect timing of said sampling, with negligible superimposed alternating currents, and

utilizing said direct current in a negative-feedback loop with direct current amplification, and delay and response equalization of alternating currents, to reduce said incorrect timing of said sampling, and

reconstructing said samples to obtain said combined wave substantially free from said selected periodic wave.

4,456,991

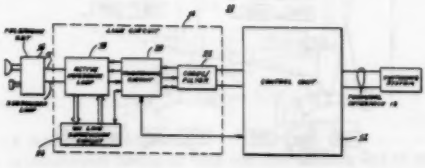
TELEPHONE LINE CIRCUIT AND SYSTEM

Ramon C. W. Chea, Jr., Monroe; Santanu Das, Huntington; Daniel C. Upp, Southbury, all of Conn.; Jozef Cornu, Stekene, Belgium; Johan M. R. Daaneels, Rupelmonde, Belgium, and Jean R. J. M. Taeymans, Wilrijk, Belgium, assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Continuation of Ser. No. 303,457, Sep. 18, 1981. This application Jan. 10, 1983, Ser. No. 456,638

Int. Cl.³ H04Q *11/04*; H04M *3/00*

U.S. Cl. 370—58 **19 Claims**



1. A telephone system for providing a plurality of telephone line functions for a subscriber line, comprising a telephone line circuit including

a controllable active circuit loop for providing a high voltage interface to said subscriber line, and for providing impedance matching means which reduces the power dissapation of said telephone line circuit and reduces the impedance mismatch between said line circuit and a terminal interface;

a line supervision means for sensing the state or condition of said active circuit loop, and for determining the activity

status of said telephone line circuit, said supervision means having controllable logic means for generating control signals for transfer to a control unit in response to the condition of said active circuit and the status of said telephone line circuit,

a codec and filtering means for performing digital to analog, and analog to digital conversions, and for performing voice band filtering,

a controllable conditioning circuit for preparing signals coupled thereto from said codec and filter means for interface to said subscriber line and also for preparing signals coupled thereto from said active circuit loop for transmission from said conditioning circuit to a terminal interface by providing two to four wire hybrid conversion, and signal amplification, attenuation, equalization and balancing, and

a control means for controlling said controllable active circuit loop, said controllable conditioning means and said controllable logic means of said line supervision means, and for providing interfaces from a plurality of line circuits to both a switching network and an external processor.

4,456,992

METHOD AND APPARATUS FOR ENHANCING THE PROBABILITY OF ERROR-FREE RECEPTION OF DIGITAL SIGNALS

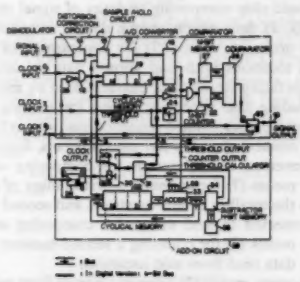
Thomas Schaub, Thalwil, Switzerland, assignor to LGZ Landis & Gyr Zug AG, Zug, Switzerland

Filed Oct. 28, 1981, Ser. No. 315,632

Claims priority, application Switzerland, Nov. 4, 1980, 8177/80

Int. Cl.³ H04L *1/20*

U.S. Cl. 371—6 **18 Claims**



1. In a method of enhancing the probability of substantial error-free reception of a signal including a sequence of discrete bits with the aid of a time-variable threshold value, each bit having a predetermined duration, wherein said threshold value may change during said duration, wherein each received bit is composed of an integral number of discrete sampled levels during said bit duration, and wherein said threshold value includes an equal number of discrete threshold levels during said bit duration,

the steps comprising

comparing at least a selected one of the received bits during the duration of said bit a multiple number of times with said threshold value,

assigning a discrete sampled bit level a logical "1" when its level exceeds the level of the corresponding discrete threshold value,

assigning a discrete sampled bit level a logical "0", when its level falls below the corresponding discrete threshold value, and

assigning a received bit a logical "1", if more than one-half of the discrete sampled bit levels have been assigned a logical "1", thereby establishing the probable validity of the received bits in dependence of the comparison results.

4,456,993

DATA PROCESSING SYSTEM WITH ERROR PROCESSING APPARATUS AND ERROR PROCESSING METHOD

Shozo Taniguchi, Minato; Osamu Shinke; Masami Ishii, both of Kawasaki, and Shinichi Kubo, Arakawa, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

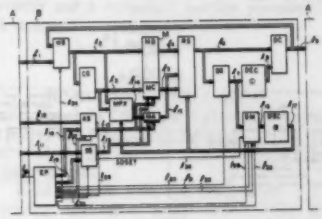
PCT No. PCT/JP80/00175, 371 Date Mar. 30, 1981, 102(e) Date Mar. 30, 1981, PCT Pub. No. WO81/00481, PCT Pub. Date Feb. 19, 1981

PCT Filed Jul. 29, 1980, Ser. No. 247,297

Claims priority, application Japan, Jul. 30, 1979, 54-97111

Int. Cl.³ G06F *11/10*

U.S. Cl. 371—10 **19 Claims**



1. A data processing system, comprising:

a main memory;

a data processing unit, operatively connected to said main memory, for processing data stored in said main memory;

an error processing unit, operatively connected to said data processing unit and said main memory, for processing error data read from said main memory, said data processing unit being interrupted from accessing said main memory during a time said error processing unit is accessing said main memory, said error processing unit including an error storing means for storing the error data read from said main memory;

error informing means, operatively connected to said main memory and said error storing means, for informing said error storing means of said error data;

data correcting means, operatively connected to said main memory and said error informing means, for correcting data read from said main memory so as to output a corrected data when said error data is detected in data read from said main memory;

an alternate memory, operatively connected to said error processing unit and said data correcting means, for storing said corrected data under the control of said error processing unit;

said error processing unit further comprising access determining means included in said error processing unit, operatively connected to said main memory, said error informing means and said error storing means, for determining whether said error processing unit should access said main memory in response to said error data stored in said error storing means;

error analyzing means, operatively connected to said error informing means and said error processing unit, for analyzing error data read from said main memory (M),

alternate-operation control means, operatively connected to said error analyzing means and said error informing means, for determining whether said corrected data should be stored in said alternate memory in response to the result of the error analysis by said error analyzing means; and

data switching means, operatively connected to said alternate memory, said data processing unit, said error analyz-

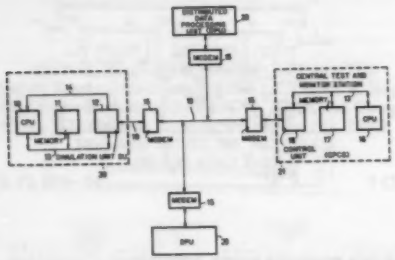
ing means, said error processing unit and said data correcting means, for transferring said corrected data stored in said alternate memory to said data processing unit when said error processing unit determines to alternate an error generating portion in said main memory with said alternate memory as a result of the error analysis.

4,456,994

REMOTE SIMULATION BY REMOTE CONTROL FROM A COMPUTER DESK

Gérard Segarra, Roissy-en-Brie, France, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 114,861, Jan. 24, 1980, abandoned. This application Dec. 10, 1981, Ser. No. 329,377
Claims priority, application France, Jan. 31, 1979, 79 02524
Int. Cl.³ G06F *11/22*
U.S. Cl. 371—16 17 Claims



1. A data processing system (DPU) having a plurality of distributed data processing units interconnected to a remote central test and monitor station, said central test and monitor station having sending means for successively sending a first series of specific commands to a distributed data processing unit, each distributed data processing unit having

(a) a control panel,

(b) processing means for processing instructions of a standard instruction set,

(c) a simulation unit having

(c1) storage means for receiving and storing said first series of specific commands emanated from said central test and monitor station as diagnostic commands, including such diagnostic commands for the diagnostics of the control panel, to be processed in said processing means in lieu of instructions from said standard instruction set,

(c2) a microprogrammed logic unit interconnecting said storage means and said processing means for decoding each diagnostic command, as a sequence of at least one microinstruction to be stepwise processed in said processing means (CDCS),

(c3) modifying means connected to said storage means and said microprogrammed logic unit under control of an external signal for modifying the storage content of said storage means and/or a decoding function in said microprogrammed logic unit to effect storing and execution of a second series of specific commands as diagnostic commands, which second series is different from said first series of specific commands,

(c4) transmitting means for transmitting a processing result of processing a specific command of either said first or said second series to said central test and monitor station,

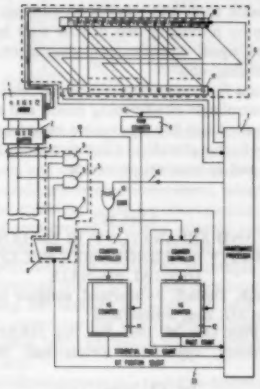
and wherein said central test and monitor station has furthermore testing and monitoring means for testing and monitoring a processing result received from a distributed data processing unit.

4,456,995

APPARATUS FOR HIGH SPEED FAULT MAPPING OF LARGE MEMORIES

Philip M. Ryan, Hopewell Junction, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

PCT No. PCT/US81/01683, 371 Date Dec. 18, 1981, 102(e) Date Dec. 18, 1981, PCT Pub. No. WO83/02164, PCT Pub. Date Jun. 23, 1983
PCT Filed Dec. 17, 1981, Ser. No. 345,944
Int. Cl.³ G01R *31/28;* G06F *11/00*
U.S. Cl. 371—21 18 Claims



1. A computer memory system comprising an array of chips (1), each said chip comprising an array of signal storage locations (FIG. 2), into which known data is introduced, me ns including processor means (7) for comparing (10) data ad from said locations with said known data to determine the presence of faulty stored data, characterized by means (7, 6, 2, 3, 5) including said processor means for reading from said locations in a predetermined sequence, said means for comparing being connected to the last named means, first means (12, 14, 4) connected to said means for comparing and to said processor means (7) for counting a first number of faulty data read from the totallity of said locations, and second means (11, 13, 4) connected to said means for comparing and to said processor means (7) for counting a second number of sequential faulty data read from said locations,

said processor means (7) receiving signals from said first (12, 14, 4) and second means (11, 13, 4) representing said first and second numbers for determining therefrom and from said predetermined sequence the type of said faulty data.

4,456,996

PARALLEL/SERIES ERROR CORRECTION CIRCUIT

Lawrence J. Haas; Arthur W. Klibbe, both of Broomfield, and Pedro I. Perez-Mendez, Westminster, all of Colo., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

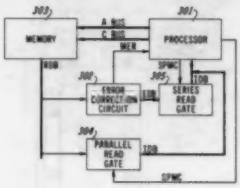
Filed Dec. 2, 1981, Ser. No. 326,828
Int. Cl.³ G06F *11/00*
U.S. Cl. 371—37 11 Claims

1. In a data transmission system having a processor (301) and a data transit medium and where said processor has an input data bus (IDB) and said data transit medium has an output data bus (RDB), an error correction system comprising:

parallel read gate means (304) connected between said output data bus (RDB) and said input data bus (IDB) and responsive to the receipt of a data word on said output data bus (RDB) from said data transit medium for transmitting said data word from said output data bus (RDB) to

said input data bus (IDB) to provide normal processing operations of said processor (301);

error correction circuit means (302) connected to said output data bus (RDB) and responsive to the receipt of said data word being output by said data transit medium on said output data bus (RDB) for applying an error indication signal when said data word contains an error on an error sense lead (MER) connected to said processor to interrupt the normal processing operation of said processor (301);



means in said error correction circuit means (302) responsive to said data word containing an error for correcting said data word to apply said corrected data word on an error output bus (EDB); and

series read gate means (305) interposed between said error correction circuit (302) and said input data bus (IDB) and responsive to said corrected data word on said error output bus (EDB) for transmitting said corrected data word to said input data bus (IDB) during interrupted normal processing operations.

4,456,997

FACILITY FOR FAIL-SAFE DATA TRANSMISSION BETWEEN TRACKSIDE EQUIPMENT OF A GUIDEWAY AND VEHICLES MOVING THEREALONG

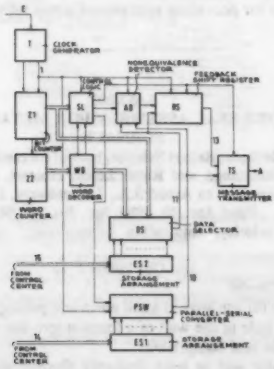
Dieter Spitza, Gerlingen, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Sep. 14, 1981, Ser. No. 301,670

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1980, 3040080

Int. Cl.³ G06F *11/16*; H04L *1/22*

U.S. Cl. 371—68 **5 Claims**



1. A facility for fail-safe data transmission between trackside equipment of a guideway and vehicles moving along said guideway comprising:

data transmitting equipment in said trackside equipment to transmit data to said vehicle in the form of serial bit data messages protected against errors by means of a cyclic code using a redundancy technique, said transmitting equipment including

two independent storage arrangements each having identical data stored therein;

a message transmitter to transmit data to said vehicle;

a first parallel-serial converter coupling one of said two storage arrangements to said message transmitter;

a second parallel-serial converter coupled to the other of said two storage arrangements;

a feedback shift register coupled between said second parallel-serial converter and said message transmitter; and

means coupled to said first converter and said shift register to time the delivery of data to said message transmitter from said first converter and said shift register to provide a data message for transmission to said vehicle having an information portion provided by said first converter and a redundant portion provided by said shift register.

4,456,998

SEMICONDUCTOR LASER

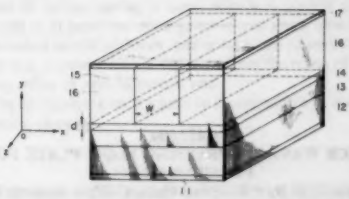
Fujio Tanaka; Yasuyuki Okamura; Yukitoshi Kushiro, all of Tokyo; Chuichi Ota, Fuchu, and Shigeyuki Akiba, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed May 22, 1981, Ser. No. 266,610

Claims priority, application Japan, Jun. 2, 1980, 55-72744; Jun. 2, 1980, 55-72745; Jun. 2, 1980, 55-72746; Jun. 2, 1980, 55-72747

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—45 **4 Claims**



1. In a semiconductor laser, a substrate of InP, an active layer of semiconductor, and two clad layers of semiconductor holding therebetween the active layer, and the refractive index of the active layer being larger than the refractive indexes of the two clad layers, characterized in that, one of the clad layers, has a region thereof adjoining a radiation region in the active layer and in which the retractive index is larger than the refractive index of a region of said one clad layer adjoining a non-radiation region in the active layer; the refractive index of the other clad layer being equal to the refractive index of said region of said one clad layer adjoining the radiation region; and the thickness and width of the radiation region of the active layer being selected so that the semiconductor laser oscillates in the fundamental transverse mode.

4,456,999

TERRACE-SHAPED SUBSTRATE SEMICONDUCTOR LASER

Takashi Sugino, Takatsuki; Kunio Itoh, Uji; Masaru Wada, Takatsuki, and Hirokazu Shimizu, Toyonaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Jun. 4, 1981, Ser. No. 270,352

Claims priority, application Japan, Jun. 13, 1980, 55-80586

Int. Cl.³ H01S *3/19*

U.S. Cl. 372—45 **3 Claims**

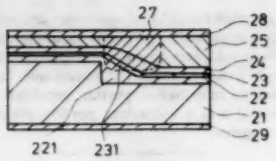
1. In a semiconductor laser including a terrace-shaped semi-

conductor substrate having a thin part of a thicker part with a step inbetween,

the improvement comprising:

semiconductor epitaxial layers to form a double-hetero structure including an active layer which are formed on said terrace-shaped semiconductor substrate, therby said active layer comprising an oblique lasing region at the part over a part which is near said step,

a thickness of said oblique lasing region being larger than that of a horizontal region of said active layer,



a surface overriding the uppermost layer of said semiconductor epitaxial layers and having an opposite conductivity to that of the uppermost layer, and

a stripe-shaped impurity diffused region having an impurity opposite to that of said surface layer, said impurity diffused region having a pattern which is substantially parallel to and above said oblique lasing region and a corner of a diffusion front near to said step reaches at least said oblique lasing region.

4,457,000

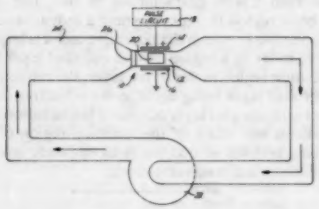
SHOCK WAVE SUPPRESSING FLOW PLATE FOR PULSED LASERS

Gadicheria V. R. Rao, Thousand Oaks, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Mar. 3, 1982, Ser. No. 354,321

Int. Cl.³ H01S 3/22

U.S. Cl. 372—58 **8 Claims**



1. In a gas laser of the type having a laser cavity through which a gas is passed, the gas being subjected to a pulsed electric field in the cavity for exciting the gas molecules, the improvement comprising: apparatus for blocking shock waves from disturbing the gas upstream of the cavity comprising:

a flow plate having a plurality of passages therethrough for directing gas from a plenum chamber into the laser cavity, each of the passages being shaped to provide a throat portion, a supersonic nozzle portion, a supersonic diffuser portion and a subsonic diffuser portion.

4,457,001

HOUSING SYSTEM FOR A LASER

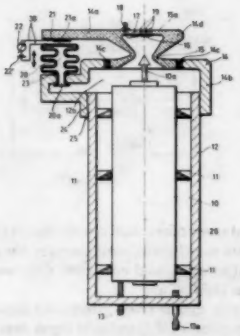
Gunther Sepp, Ottobrunn, and Peter Dyrna, Haar, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 4, 1982, Ser. No. 354,891

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109568

Int. Cl.³ H01S 3/02

U.S. Cl. 372—59 **10 Claims**



1. A housing system for a laser having a laser beam projection axis (26), comprising a first laser housing (10), a second housing, means for operatively supporting said first laser housing in said second housing, said second housing comprising a casing and a cap secured to the casing in a gas tight manner for keeping the second housing normally also filled with a laser gas under reduced pressure, said cap having a neck section surrounding said laser beam projection axis, said neck section having a predetermined break strength smaller than that of the rest of the cap for breaking along said neck section, and bellows means mounted in said cap so that the interior of the bellows communicates with the interior of said second housing, said bellows means being biased and arranged for cooperation with said neck section for breaking said neck section when said bellows means expand in response to a pressure increase in said second housing, and indicator means operatively located in said cap for providing operational status information.

4,457,002

ELECTRODE SEAL ASSEMBLY FOR METALLURGICAL FURNACE

Georges Mathgen; Robert Scherer, both of Luxembourg; Charles Prüm, Dudelange, and Roger Leick, Hostert, all of Luxembourg, assignors to Arbed S.A., Luxembourg, Luxembourg

Filed Apr. 20, 1983, Ser. No. 486,842

Claims priority, application Luxembourg, Apr. 22, 1982, 84104

Int. Cl.³ H05B 7/12

U.S. Cl. 373—95 **16 Claims**

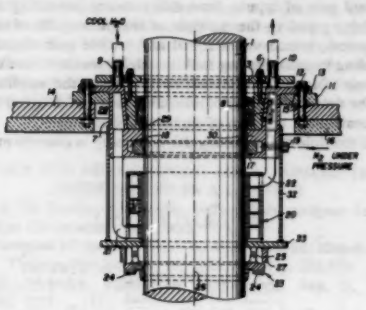
1. A seal for use around a rod electrode passing along an axis through a hole in the wall of a furnace into the interior of the furnace, the seal comprising:

an annular and at least limitedly flexible seal ring fitted snugly around the electrode in the hole;

a holder carrying the seal ring and sealingly engaged with the furnace wall, whereby gas flow through the wall at the hole past the seal ring is substantially blocked;

structure forming with the electrode and seal ring a substantially closed chamber surrounding the electrode axially inward into the furnace from the ring;

means for pressurizing the chamber at superatmospheric pressure with a gas; and



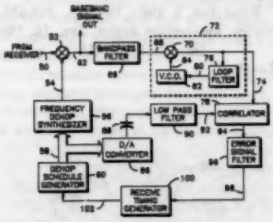
means for cooling the electrode inward of the furnace from the seal ring.

4,457,003

TIME REFERENCE TRACKING LOOP FOR FREQUENCY HOPPING SYSTEMS

Francis K. Reed, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Jun. 21, 1982, Ser. No. 390,497
Int. Cl.³ H04K *1/00*; H04B *1/10*
U.S. Cl. 375—1 **2 Claims**



1. A method for dehopping a hopped frequency in a communications system comprising the steps of:

supplying a pilot tone in a transmitter of the communications system which carries a frequency modulation that is correlated with an output of a hop schedule generator of said transmitter;

recovering said pilot tone in a receiver of the Communications system;

detecting a phase modulation of said recovered pilot tone; and

correlating said phase modulation of said recovered pilot tone with an output of a dehop schedule generator to produce an error signal that is proportional to a system timing error; and

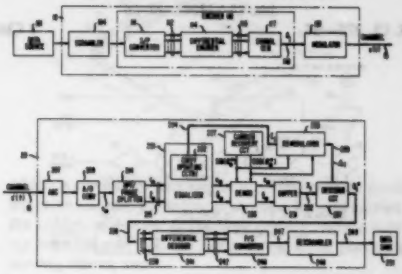
applying said error signal to said dehop schedule generator to correct said system timing error toward zero.

4,457,004

MULTIDIMENSIONAL CHANNEL CODING

Allen Gersho, Goleta, Calif., and Victor B. Lawrence, Holmdel, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 8, 1982, Ser. No. 346,627
Int. Cl.³ H04L *25/04, 25/20*
U.S. Cl. 375—67 **10 Claims**



1. Signal processing apparatus comprised of

means for receiving a sequence of signal indications each having one of M predetermined values,

means for generating for each of said signal indications, as a function of its value, a signal representing a particular member of a predetermined n-dimensional alphabet, said alphabet being comprised of M points of a selected coset of a selected n-dimensional lattice, n>2, at least one of said M points having a norm which is greater than the norm of at least one other point of said coset which is not included in said alphabet, and at least one of said M points having a norm which is different from the norm of at least one other of said M points, and

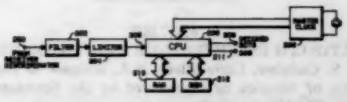
means for applying each signal thus generated to a communication channel.

4,457,005

DIGITAL COHERENT PSK DEMODULATOR AND DETECTOR

Timothy M. Burke, Fort Worth, and Scott W. Noble, Bedford, both of Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 7, 1981, Ser. No. 328,332
Int. Cl.³ H03D *3/18*
U.S. Cl. 375—82 **15 Claims**



11. A method for demodulation and detection of PSK encoded digital signals, wherein a clock signal is provided, comprises the steps of:

a. frequency dividing the clock signals to provide sampling pulses;

b. digitally sampling the encoded signal in response to each sampling pulse to generate a current sample, and storing the sample taken in response to the previous pulse;

c. generating a transition signal in response to a difference between the stored sample and the current sample;

d. frequency dividing the sampling pulses to generate a subtract loop pulse and an add loop pulse;

e. modifying the frequency of the sampling pulses in response to a transition signal such that the sampling pulse

frequency is increased in response to the add loop pulse and decreased in response to the subtract loop pulse; and

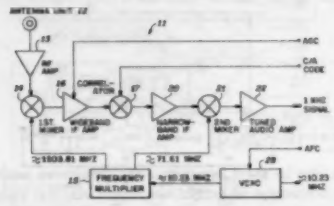
f. generating demodulated baseband signal samples.

4,457,006

GLOBAL POSITIONING SYSTEM RECEIVER

Reuben E. Maine, Charlottesville, Va., assignor to Sperry Corporation, New York, N.Y.

Filed Nov. 16, 1981, Ser. No. 321,945
Int. Cl.³ H04L 27/06
U.S. Cl. 375—87 **8 Claims**



1. A receiver for use in a navigation system comprising:

a voltage controlled oscillator,

means for generating a plurality of signals having phase locked frequencies responsive to said voltage controlled oscillator;

first mixing means responsive to a biphase modulated radio frequency input signal and a first signal from said phase locked signal generator means for providing intermediate frequency signals;

second mixing means responsive to the the intermediate frequency signals and a second signal from the phase locked signal generator means for providing audio frequency signals;

audio signal processing means, responsive to the audio frequency signal and to an audio frequency reference signal that is phase locked to the voltage controlled oscillator for detecting the audio frequency signal amplitude and for providing a fast frequency control signal for the voltage controlled oscillator, and including means for phase shifting the audio frequency reference signal; and

processing means for providing control signals to the phase shifting means and responsive to the audio frequency signal amplitude, the fast frequency control signal, and the phase shifted reference signal for providing a coarse frequency control signal which is summed with the fast frequency control signal and applied to the voltage controlled oscillator and for obtaining data from the audio frequency signal.

4,457,007

MULTIPATH INTERFERENCE REDUCTION SYSTEM

Frank S. Gutleber, Little Silver, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Nov. 29, 1982, Ser. No. 445,333
Int. Cl.³ H04B 1/12
U.S. Cl. 375—102 **6 Claims**

1. A system for reducing multipath return interference in a multiple user communication system comprising:

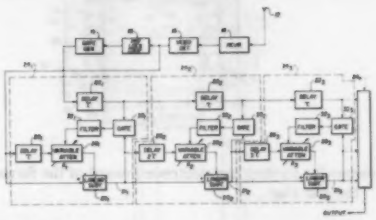
a plurality of user communications apparatus, one for each user, being operable to communicate with each other in respective time slots of a plurality of mutually adjacent time slot channels;

each said communications apparatus including means for receiving and detecting pulse type signals including a desired signal and any multipath return signals and providing pulse type video signals thereof having respective amplitudes and pulsewidths, and

a plurality of cascaded signal subtractor units each comprised of signal combiner means having a pair of inputs and being operable to provide a difference signal at an output in response to respective input signals applied to said pair of inputs, time delay means providing a time delay equal to the multiple of the pulsewidth of the detected desired video signal and varible gain signal coupling means coupling said time delay means to one of said pair of inputs, and means responsive to the amplitude of the detected multipath return video signal coupled to and controlling the gain of signal coupling means,

said multiple of the pulsewidth increasing in discrete numerical steps beginning with the first of said plurality of subtractor units to the last, and

means coupling detected video signals in sequence first from said detector means and then from said output of the preceding signal combiner means to the other of said pair of inputs of said combiner means and said time delay means in synchronism, whereby video signals sequentially applied to each subtractor unit are selectively delayed, varied in amplitude and subtracted from the same respective undelayed video signals, causing the multipath return signals to be selectively cancelled while providing an output of the desired signal.

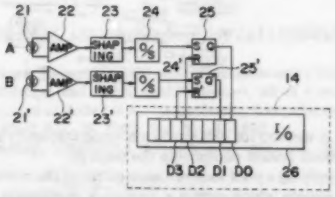


4,457,008

AUTOMATIC RETRIEVAL APPARATUS

Keiji Nakatani, Kawasaki, and Masaharu Arakaki, Sagamihara, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jun. 2, 1981, Ser. No. 269,655
Claims priority, application Japan, Jun. 14, 1980, 55-80639
Int. Cl.³ G03B 23/12
U.S. Cl. 377—18 **4 Claims**



1. An automatic retrieval apparatus for use with an information containing film in a roll form, arranged to control driving of said information containing film by reading marks provided in said information containing film so as to correspond to respective frames thereof, said retrieval apparatus comprising a plurality of detecting means corresponding to a plurality of channels for detecting said marks so as to produce a plurality of detecting signals, a plurality of latch means which are respectively set by the corresponding detecting signals, a calculation processing means which effects a predetermined calculation corresponding to the detecting of said marks when one of said plurality of latch means is in its set state and which pro-

duces a signal for resetting said one latch means upon completion of the calculation processing, said calculation processing means further being arranged to effect said predetermined calculation in a sequential order when said plurality of latch means are being set simultaneously by said detecting signals by resetting the first latch means after the calculation corresponding to the first channel is completed and executing the calculation corresponding to the next channel following setting of the next one of said plurality of latch means.

4,457,009

DEVICE FOR DETERMINING LOCAL ABSORPTION DIFFERENCES IN AN OBJECT

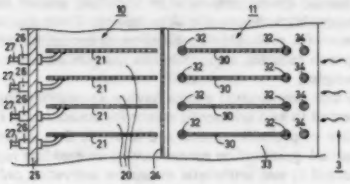
Peter J. M. Botden, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 181,601, Aug. 27, 1980, abandoned. This application Jun. 16, 1982, Ser. No. 388,828

Claims priority, application Netherlands, Sep. 5, 1979, 7906634

Int. Cl.³ G03B *41/16*

U.S. Cl. 378—19 **1 Claim**



1. A device for determining local absorption differences in a cross-section through an object, said device comprising:

an X-ray source for generating a flat, fan-shaped X-ray beam, said beam irradiating the object from different directions; and

an X-ray detector directed toward the X-ray source:

characterized in that the X-ray detector comprises:

a plurality of detectors having sidewalls which are directed toward the X-ray source;

a plurality of plate-shaped collimating elements arranged between the detectors and the souce, each collimating element being substantially coplanar with a corresponding sidewall of a detector; and

a plurality of radiation absorbing elements, one radiation absorbing element arranged between each collimating element and the X-ray source, each radiation absorbing element having a length in a direction of propagation of the X-ray beam which is less than that of the corresponding collimating element, and each radiation absorbing element having a width in a direction transverse to the propagation direction and in the plane of the fan-shaped beam which is greater than that of the corresponding collimating element.

4,457,010

CASSETTE-GRID HOLDING APPARATUS

John L. Jenkins, Mentor, Ohio; Larry L. Pierce, and June S. Pierce, both of Douglasville, Ga., assignors to Picker International, Inc., Cleveland, Ohio

Filed Aug. 11, 1981, Ser. No. 292,035

Int. Cl.³ G03B *41/16*

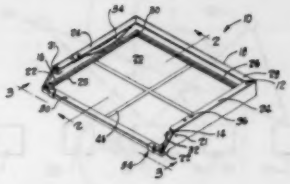
U.S. Cl. 378—167 **9 Claims**

1. A portable radiographic cassette and grid holder for use in hospital emergency rooms or the like comprising a housing and frame structure, the housing and frame structure including:

(a) a pair of side rail portions and a back rail portion each including a plurality of flanges and collectively defining spaced and parallel grid and cassette holding channels, the rail portions at least partially surrounding a beam transmittal area through which a radiograph producing x-ray beam is transmitted to expose a film when the holder is in use;

(b) a bracing means interposed between the side rail portions and also partially bounding said beam transmittal area;

(c) a cover spanning said area and formed of a material



which is essentially transparent to a radiographic producing beam and also providing protection for grid carried by the holder, said cover defining an exterior surface extending between said side rail portions, back rail portion and bracing means; and

(d) a pair of spaced springs each mounted in a different side rail portion of the cassette channel.

4,457,011

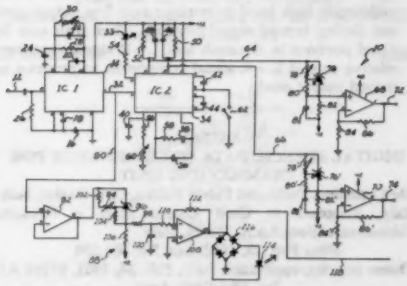
FM BROADCAST BAND DEMODULATOR/STEREO DECODER

Brian L. Hoover, 1153 Alpine Dr., South Bend, Ind. 46614

Filed Sep. 30, 1982, Ser. No. 432,075

Int. Cl.³ H04H *5/00*

U.S. Cl. 381—2 **6 Claims**

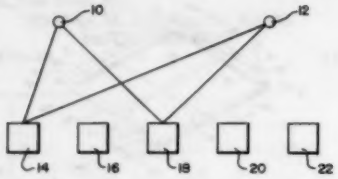


1. An FM demodulator and stereo decoder for connection to a tuner, comprising a first integrated circuit demodulating means connected to a single ended power supply for receiving a signal from said existing tuner and producing an isolated wide band signal output, a second integrated circuit decoding means connected to a single ended power supply and directly coupled to said first integrated circuit demodulating means for receiving said isolated wide frequency band signal and producing a limited frequency width signal divided into a left and a right stereo channel, left and right channel leads connected to said second integrated circuit, means placed in each said left and right channel leads for shifting the d-c component from said limited frequency width signal, and amplifying means placed in said left and right channel leads for amplifying said limited frequecy width signal after said d-c component is removed therefrom, whereby a load may be driven.

4,457,012
FM STEREO APPARATUS AND METHOD

Robert W. Carver, 330 Ave. A, Snohomish, Wash. 98290

Filed Jun. 3, 1982, Ser. No. 384,526
Int. Cl.³ H04H 5/00
U.S. Cl. 381—3 97 Claims



1. An apparatus to provide an improved FM stereo output, where there is an L+R signal component corresponding to the sum of an L signal and an R signal, and an L−R signal component corresponding to the difference of the L signal and the R signal, said apparatus comprising:

(a) input means to provide an input signal made up of said L+R signal component and said L−R signal component;

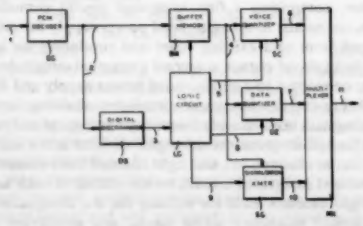
(b) output means including matrix means to receive and combine said signal components at respective sufficiently high levels to produce a first output mode where there is a first output component corresponding more to said L signal and a second output component corresponding more to said R signal so as to be able to provide directional information, and to receive at least said L+R signal at a sufficiently greater level than said L−R signal to produce a second output mode where said first and second output components both correspond more closely to said L+R signal component;

(c) control means including detector means to detect from said signal first signal portions where there is a more abrupt change of amplitude and to transmit the L−R signal components of said first signal portions at said sufficiently high level to produce said first output mode, and during second signal portions other than said first signal portions to diminish said L−R signal component relative to said L+R signal component to produce said second output mode.

4,457,013
DIGITAL SPEECH/DATA DISCRIMINATOR FOR TRANSCODING UNIT

Paolo Castellino, Turin, and Fulvio Rusina, Cirie-Torino, both of Italy, assignors to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A., Turin, Italy

Filed Feb. 23, 1982, Ser. No. 351,538
Claims priority, application Italy, Feb. 24, 1981, 67251 A/81
Int. Cl.³ G10L 1/00
U.S. Cl. 381—46 6 Claims



1. In a transcoding unit of a telecommunication system including circuit means for respectively directing digitized samples of speech signals and of voice-band-modulated data signals from an incoming signal path to first quantization means using a lower number of quantizing bits and to second quantization means using a higher number of quantizing bits for each outgoing sample, said coders having outputs switchable to an outgoing transmission line,

the combination therewith of a digital discriminator with an input stage connected to said signal path for receiving said samples in parallel with said first and second quantization means, said discriminator comprising:

a first transversal filter connected to said input stage with a transfer function equal to the reciprocal of the mean bandwidth of incoming speech signals;

a second transverse filter connected to said input stage with a transfer function equal to the reciprocal of the mean bandwidth of incoming data signals;

a digital low-pass filter connected to said input stage;

first, second and third integrating means respectively connected to said first transversal filter, said second transversal filter and said low-pass filter for accumulating output signals thereof over a predetermined evaluation period; and

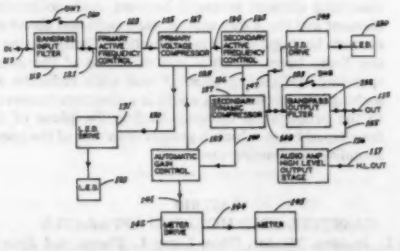
arithmetic means connected to said first, second and third integrating means for determining from the contents thereof a probable classification of incoming samples as speech samples, high-rate data samples or low-rate data samples;

said first quantization means having an enabling input connected to said arithmetic means for activation in the presence of probable speech and low-rate data samples, said second quantization means having an enabling input connected to said arithmetic means for activation only in the presence of probable high-rate data samples.

4,457,014
SIGNAL TRANSFER AND SYSTEM UTILIZING TRANSMISSION LINES

Graham P. Bloy, Bangkok, Thailand, assignor to Metme Communications, St. Louis, Mo.

PCT No. PCT/US81/01147, 371 Date Aug. 26, 1981, 102(e) Date Aug. 26, 1981, PCT Pub. No. WO83/00787, PCT Pub. Date Mar. 3, 1983
Continuation-in-part of Ser. No. 265,990, Oct. 3, 1980, Pat. No. 4,368,435. This PCT application Aug. 26, 1981, Ser. No. 302,562
Int. Cl.³ H04B 1/66
U.S. Cl. 381—98 23 Claims



1. For use with a transmission line over which signals may be transmitted in either of opposite directions, a signal transfer and processing system comprising interface circuitry and processing circuitry, said processing circuitry comprising signal input means for receiving a line transmissible input signal to be processed, and signal output means for providing a processed signal for further use, characterized by primary dynamic control means for dynamically compressing the input signal thereby to provide a primarily compressed signal, frequency level control means for selectively controlling the relative

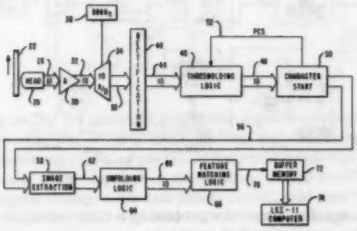
amplitude of said primarily compressed signal within different frequency bands, thereby to provide a frequency controlled dynamically compressed signal, secondary dynamic control means for dynamically compressing said frequency controlled primarily compressed signal, thereby supplying a secondarily compressed signal, and feedback means providing between said primary and secondary dynamic control means feedback for limiting the dynamic compressing of said input signal as a function of increase in the level of said secondarily compressed signal, said signal output means providing said secondarily compressed signal as said processed signal, said interface circuitry comprising signal responsive circuitry which is responsive to the direction of signal transmission on said transmission line of signals to be processed, said signal responsive circuitry being operative to cause interconnection of said processing circuitry with said transmission line for causing signals transmitted over said transmission line to be automatically directed through said processing circuitry thereby to produce processing of such signals.

4,457,015

MATRIX CHARACTER PREPROCESSING SYSTEM

Robert B. Nally; James F. Akister; Patrick C. Leung, all of Waterloo, and Eric J. Vance, Kitchener, all of Canada, assignors to NCR Corporation, Dayton, Ohio

Filed Dec. 17, 1981, Ser. No. 331,936
Int. Cl.³ G06K 9/32
U.S. Cl. 382—45 **12 Claims**



1. A method for processing data signals representing an unknown character comprising the steps of:

generating a plurality of parallel rows of first data signals representing feature characteristics of a character and rows of second data signals representing background characteristics of a character;

detecting the largest number of consecutive rows of only said second data signals;

detecting the first row of first data signals which is adjacent to said rows of said second data signals;

and generating a control signal identifying the adjacent first row as the top row of the character.

4,457,016

FILE LABEL READING SYSTEM

George B. Pfeffer, Minnetonka, Minn., assignor to Datafile Limited, Willowdale, Canada

Filed Oct. 10, 1980, Ser. No. 192,631
Int. Cl.³ G06K 9/00
U.S. Cl. 382—59 **21 Claims**

1. A hand-held wand adapted for accurate machine reading of a machine readable code provided on an article with a generally flat edge region having a substantially straight peripheral edge with the machine readable code running generally parallel to such peripheral edge fixed relative thereto, said wand having a precise scan field through a read window requiring a substantially exact locating over the code for reading thereof, said wand being provided with jig means projecting beyond said read window to form an open step-like construction with said jig means being at a substantially 90 degree angle with said read window whereby when the edge region is placed in a horizontal position said jig means extends downwardly over and bears against the peripheral edge to locate said read window over the code, said jig means being of a

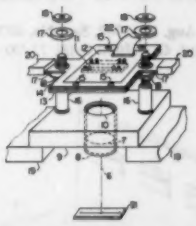
length to provide a horizontally extended generally upright contact with the peripheral edge to guide movement of said wand and to resist horizontal pivoting of said read window over the code as said jig means rides along the peripheral edge of the horizontally positioned edge region.

4,457,017

METHOD OF ADJUSTING POSITION OF SOLID-STATE SCANNING ELEMENT AND MOUNTING SAME

Tsuyoshi Onogi; Tetsuya Ueoka, both of Odawara; Nobuo Suzuki, Fujisawa; Yoshihito Oohara, and Toshiaki Onozuka, both of Odawara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 10, 1981, Ser. No. 272,263
Claims priority, application Japan, Jun. 11, 1980, 55-78571
Int. Cl.³ G06K 9/00
U.S. Cl. 382—65 **7 Claims**



1. A method of adjusting the position of a solid-state scanning element and mounting the same, in a manuscript reading optical block included in a manuscript reading part of a solid-state electronic scanning system, comprising the steps of:

adjusting the position of said solid-state scanning element so to provide an output therefrom of the highest optical sensitivity for an adjustment pattern forming an optical standard, said adjustment pattern and a lens support forming a positional standard being disposed with respect to an adjustment jig for said solid-state scanning element;

fixing a wiring board to said lens support utilizing the position of a pin of said solid-state scanning element as a guide, while maintaining said solid-state scanning element in the adjusted position; and

fixing said pin of said solid-state scanning element to said

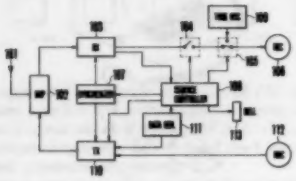
wiring board using a melt to make an electrical connection therebetween, said melt being made of solder or the like.

4,457,018

RADIO TELEPHONE SYSTEMS AND METHOD FOR USE IN VEHICLES

Yoshikazu Takayama, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 234,003, Feb. 12, 1981, abandoned. This application May 3, 1983, Ser. No. 491,087
Claims priority, application Japan, Feb. 19, 1980, 55-18484
Int. Cl.³ H04B *1/00*
U.S. Cl. 455—33 **8 Claims**



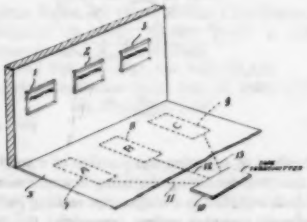
1. In a vehicle radio telephone system comprising a moving vehicle and a fixed station for voice communication utilizing a plurality of radio channels, said fixed station and said moving vehicle including means for switching a speech path from one radio channel to a second radio channel to maintain voice communication between the moving vehicle and fixed station, the improvement which comprises means included within said moving vehicle and said fixed station for informing at least one subscriber using said telephone system that said one radio channel is being switched to said second radio channel, wherein said informing means informs said at least one subscriber that said channel is being switched by generating an audible tone signal during the channel switching.

4,457,019

SYSTEM FOR SEPARATELY RECEIVING MULTIPLE STATION AUDIO-TOUR SIGNALS

Steve Szabo, Jr., Norwalk, and Noel A. Yaney, Darien, both of Conn., assignors to By-Word Corporation, East Norwalk, Conn.

Filed Aug. 12, 1982, Ser. No. 407,452
Int. Cl.³ H04B *5/00, 15/00*
U.S. Cl. 455—41 **9 Claims**



9. An audio-tour system in which a visitor may receive a different pre-recorded, repeating, taped message at each of a plurality of pre-determined listening zones including:

means for producing a first carrier wave, means for producing a second carrier wave, the frequency of said first carrier wave being at least one kilohertz different from that of said carrier wave,

repeating tape recorder and modulating means for amplitude modulating each said carrier wave with different prerecorded messages,

means for transmitting the modulated said first and said second carrier waves directly to respective pre-determined listening zones,

an untuned broadband radio receiver having a band-width including the frequencies of said carrier waves and having a substantially flat response curve over the frequencies of said carrier waves, to receive said waves and detect the amplitude modulation thereon, and

the signal strength of said transmitted signals being approximately the same in their respective predetermined listening zones,

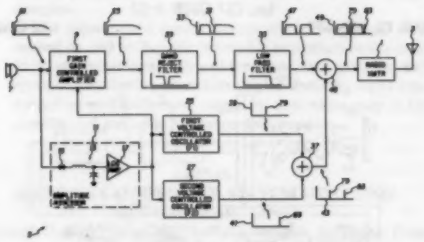
whereby, when the system is in use, one said carrier wave will dominate the other said carrier wave, depending upon the relative signal strengths of said waves of said receiver, and thereby effect a substantial reduction in cross-talk between said two transmitted messages.

4,457,020

SIGNAL PROCESSING DEVICE FOR USE ON RADIO LINKS

James R. King, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Dec. 27, 1982, Ser. No. 453,365
Int. Cl.³ H04B *1/64*
U.S. Cl. 455—70 **12 Claims**



1. A signal processor for processing a communication signal for a communication link comprising:

a transmit processing means for extracting amplitude information from the communication signal to obtain a constant amplitude signal and a first signal tone, and a second signal tone with the frequency of each signal tone representing the amplitude of the communication signal;

combining means for combining the first signal and the second signal with the constant amplitude signal to obtain a transmit signal;

receive processor means for separating the first signal tone, the second signal tone, and the constant amplitude signal from the transmit signal; and

control processor means for converting the constant amplitude signal into the communication signal in response to the separated first or second signal tone.

4,457,021

TELEVISION TUNING SYSTEM WITH MEANS TO PREVENT LOSS OF INFORMATION DURING POWER OUTAGES

Pietro Belisomi, Pinerolo, Italy, assignor to Indesit Industria Elettrodomestici Italiana S.p.A., Italy

Division of Ser. No. 040,079, May 17, 1979, Pat. No. 4,314,375. This application Oct. 13, 1981, Ser. No. 310,846
Claims priority, application Italy, May 22, 1978, 68162 A/78
Int. Cl.³ H04B *1/16*; G11C *5/00*
U.S. Cl. 455—186 **5 Claims**

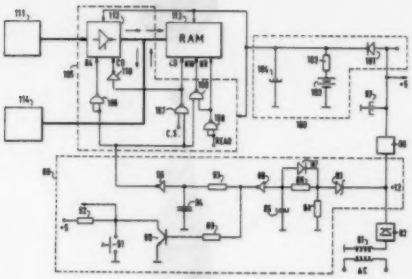
1. Apparatus for use with a television receiver, said apparatus comprising:

a power circuit for converting a mains power supply voltage to a reduced voltage which is applied as a power signal to

several components of said television receiver, said power circuit generating said reduced voltage shortly after said mains power supply voltage is applied thereto and maintaining said reduced voltage until shortly after said mains power supply voltage is removed therefrom;

a read/write memory for storing information relating to the operating parameters of said television receiver, said memory having data terminals, address terminals, and one or more control terminals for controlling operation of said memory;

a control circuit for controlling said operating parameters of said television receiver as a function of said information stored in said memory and as a function of data signals applied thereto, said control circuit changing the values of said information stored in said memory by applying control signals to said data and address terminals of said memory in response to specific data signal applied to said control circuit;



first means for generating a disable signal responsive to an interruption of said mains power supply voltage, said disable signal being generated before said reduced voltage is cut off in response to the removal of said mains power supply voltage from said power circuit, said disable signal continuing until after said reduced voltage is again generated by said power circuit in response to the reapplication of said mains power supply voltage to said power circuit;

second means responsive to said disable signal for supplying a series of fixed signals to at least one of said data and address terminals of said memory; and

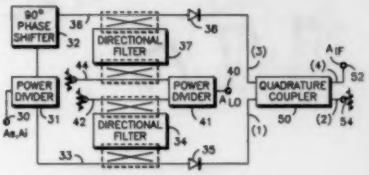
third means responsive to said disable signal for applying to at least one of said control terminals of said memory an appropriate signal for preventing said information stored in said memory from being changed during the period in which said disable signal is generated.

4,457,022

TWO DIODE IMAGE REJECTION AND PSEUDO-IMAGE ENHANCEMENT MIXER

Michael Dydyk, Scottsdale, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Apr. 28, 1982, Ser. No. 372,586
Int. Cl.³ H04B 1/26, 1/10
U.S. Cl. 455—317 **7 Claims**



1. A mixer comprising:

a modified power divider having an input suitable for application of an RF signal having a first output and having a second output;

a phase shifter coupled to said first output of said modified power divider;

a first directional filter coupled to said phase shifter;

a second directional filter coupled to said second output of said modified power divider;

means for dividing the power of a local oscillator signal coupled to said first directional filter and coupled to said second directional filter;

a first diode coupled to said first directional filter;

a second diode coupled to said second directional filter; and

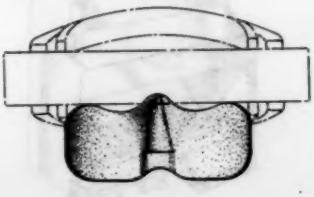
a quadrature coupler coupled to said first diode and coupled to said second diode, said quadrature coupler having an output suitable for supplying a signal.

DESIGNS

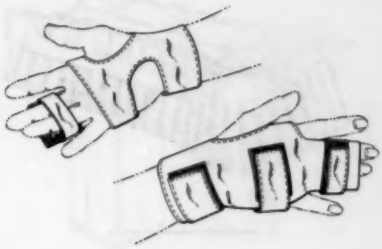
JUNE 26, 1984

274,384
HAT
David M. Koffman, 293 Elm St., Northampton, Mass. 01060, and Arnold A. Orbach, 4237 E. Grant Rd., Tucson, Ariz. 85712
Filed Feb. 24, 1982, Ser. No. 351,987
Term of patent 14 years
U.S. Cl. D2—230

274,385
SKI GOGGLE NOSE AND FACE GUARD
William A. Newcomb, 10 South Cliff Dr., Wilmington, Del. 19809
Filed Dec. 18, 1981, Ser. No. 332,017
Term of patent 14 years
U.S. Cl. D2—234

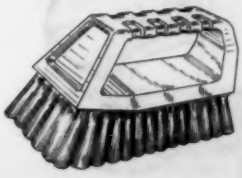


274,386
BOWLING GLOVE
Harry M. Tanaka, 1955 Young St. #EE, Honolulu, Hi. 96826
Filed Aug. 17, 1981, Ser. No. 293,298
Term of patent 14 years
U.S. Cl. D2—361

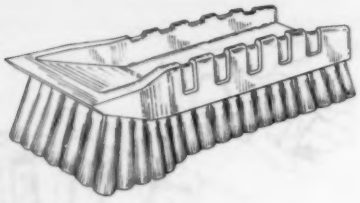


274,387
LUGGAGE CASE
Michael Davis, New Castle, Pa., and Oleg Cassini, New York, N.Y., assignors to Airway Industries, Inc., Ellwood City, Pa.
Filed Feb. 3, 1982, Ser. No. 345,021
Term of patent 14 years
U.S. Cl. D3—71

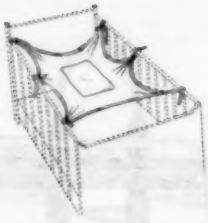
274,388
BRUSH
Robin V. Colemore-Williams, Auckland, New Zealand, assignor to Merryware Industries, Ltd., Avondale, New Zealand
Filed Apr. 24, 1981, Ser. No. 257,501
Term of patent 14 years
U.S. Cl. D4—10



274,389
BRUSH
Robin V. Colemore-Williams, Auckland, New Zealand, assignor to Merryware Industries, Ltd., Auckland, New Zealand
Filed Apr. 24, 1981, Ser. No. 257,502
Claims priority, application New Zealand, Mar. 26, 1980, 16479
Term of patent 14 years
U.S. Cl. D4—01



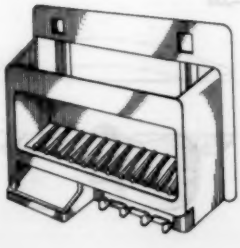
274,390
CRIB HAMMOCK
Pauline V. Shakas, 1620 Lasuen Rd., Santa Barbara, Calif. 93103
Filed Oct. 9, 1981, Ser. No. 310,111
Term of patent 14 years
U.S. Cl. D6—14



274,391
SWIVEL CHAIR
J. Thayer Coggin, High Point, N.C., assignor to Thayer Coggin Incorporated, High Point, N.C.
Division of Ser. No. 28,489, Apr. 9, 1979. This application Sep. 24, 1982, Ser. No. 423,549
Term of patent 14 years
U.S. Cl. D6—26

274,392
STACKING CHAIR
Leif Blodee, Holland, Mich., assignor to Kimball International, Inc., Jasper, Ind.
Filed Nov. 2, 1981, Ser. No. 317,013
Term of patent 14 years
U.S. Cl. D6—73

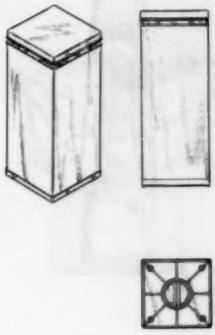
274,393
SHOWER CADDY
John D. Sinchok, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Oct. 12, 1982, Ser. No. 433,673
Term of patent 14 years
U.S. Cl. D6—86



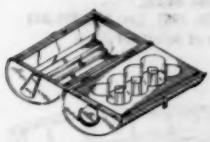
274,394
HANGER FOR POTTED PLANTS
James J. Elliott, 700 Museum Dr., Charlotte, N.C. 28207
Filed Jun. 28, 1982, Ser. No. 392,532
Term of patent 14 years
U.S. Cl. D6—113

274,395
RACQUET HOLDER
Wayne W. Beaubian, 3959 E. Speedway, Suite 314, Tucson, Ariz. 85712
Filed Feb. 8, 1982, Ser. No. 346,581
Term of patent 14 years
U.S. Cl. D6—151

274,396
VACUUM BOTTLE
Yoshito Kikuchi, Osaka, Japan, assignor to Tiger Vacuum Bottle Ind. Co., Ltd., Osaka, Japan
Filed Apr. 28, 1982, Ser. No. 372,610
Claims priority, application Japan, Dec. 5, 1981, 56-53938
Term of patent 14 years
U.S. Cl. D7—77



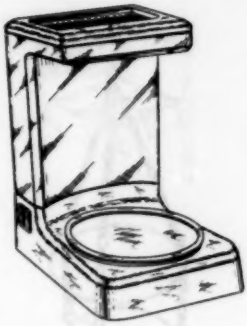
274,397
INSULATED CASE FOR BEVERAGE CONTAINERS
Michael W. Hill, Marshalltown, Iowa, assignor to Ehco, Inc., Des Moines, Iowa
Filed May 3, 1982, Ser. No. 374,340
Term of patent 14 years
U.S. Cl. D7—77



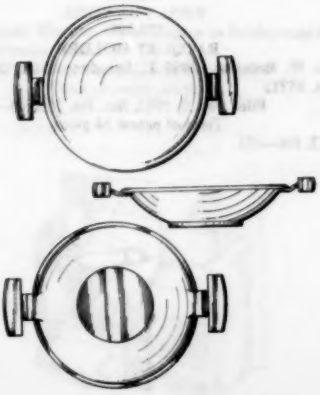
274,398
MOTOR VEHICLE
Robert A. Keyes, #6 Hickory Hill Ct., O'Fallon, Mo. 63366
Filed Jul. 21, 1982, Ser. No. 400,306
Term of patent 14 years
U.S. Cl. D12—85

274,399
KNIFE HANDLE
Lee E. Olsen, Jr., Newaygo, Mich., assignor to F & M Trading Company, Grand Rapids, Mich.
Filed Sep. 28, 1981, Ser. No. 306,341
Term of patent 14 years
U.S. Cl. D7—152

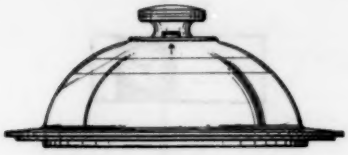
274,400
COFFEE MAKER
Ronald L. Muller, Old Saybrook, Conn., assignor to North American Philips Corporation, New York, N.Y.
Filed Mar. 15, 1982, Ser. No. 358,489
Term of patent 14 years
U.S. Cl. D7—309



274,401
COOKING PAN
Robert L. Fournier, 9528 N. Lake Rd., Otter Lake, Mich. 48464
Filed Jun. 26, 1978, Ser. No. 919,050
Term of patent 14 years
U.S. Cl. D7—360

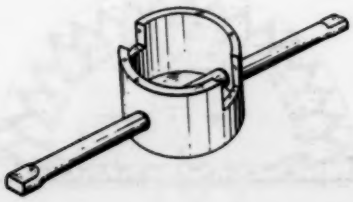


274,402
STEAM COVER FOR CULINARY VESSELS
Stephen A. Ziskind, New York, N.Y., assignor to Foxy Products, Inc., New York, N.Y.
Filed Oct. 15, 1981, Ser. No. 311,794
Term of patent 14 years
U.S. Cl. D7—391

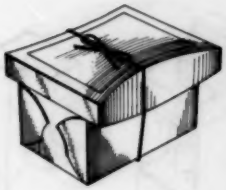


274,403
WEED PULLER
Hiram D. Clark, III, 1129 Lakeview, Mesquite, Tex. 75149
Filed Apr. 22, 1982, Ser. No. 370,786
Term of patent 14 years
U.S. Cl. D8—13

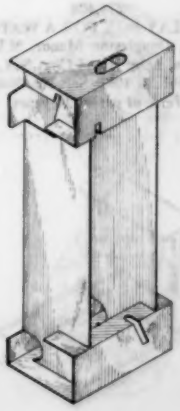
274,404
WING NUT AND PETCOCK WRENCH
David T. Adler, 110 Dumbarton Dr., Huntington, N.Y. 11743
Filed Jan. 29, 1982, Ser. No. 344,197
Term of patent 14 years
U.S. Cl. D8—28



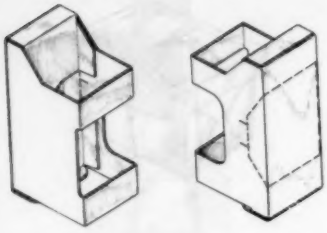
274,405
DUAL COMPARTMENTED CONTAINER FOR FOOD OR THE LIKE
Tamio Miyazaki, 3-21-29, Gaukuen-nishicho, Kodaira-shi, Tokyo, Japan
Filed May 6, 1981, Ser. No. 260,981
Term of patent 14 years
U.S. Cl. D9—341



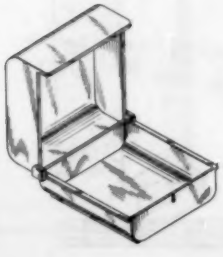
274,406
BOX FOR A HYDRAULIC TROLLEY JACK
Michael Hung, 6th Fl., No. 683 Ming Shen East Rd., Taipei, Taiwan
Filed Jan. 26, 1982, Ser. No. 342,894
Term of patent 14 years
U.S. Cl. D9—418



274,407
CONTAINER FOR PRESCRIPTION DRUGS OR THE LIKE
Charles W. Rosenburg, Jr., North Tonawanda, N.Y., assignor to F. N. Burt Company, Inc., Cheektowaga, N.Y.
Filed Mar. 8, 1982, Ser. No. 355,665
Term of patent 14 years
U.S. Cl. D9—418



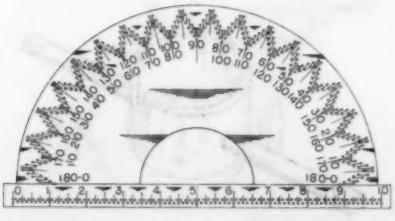
274,408
DISPLAY BOX FOR A WATCH
Bernard Fernandez, Douglaston Manor, N.Y., assignor to E. Gluck Corporation, Long Island City, N.Y.
Filed Feb. 1, 1982, Ser. No. 344,596
Term of patent 14 years
U.S. Cl. D9—423



274,409
CLOCK
Jean G. Malamoud, Saint-Jorioz, France, assignor to S. T. DuPont, Paris, France
Continuation-in-part of Ser. No. 176,445, Aug. 8, 1980, Pat. No. Des. 269,329. This application Jan. 29, 1982, Ser. No. 343,795
Claims priority, application France, Aug. 14, 1981, 812847
Term of patent 14 years
U.S. Cl. D10—18

274,410
WRISTWATCH
Takao Suzuki, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Tokyo, Japan
Filed Aug. 14, 1981, Ser. No. 292,831
Claims priority, application Japan, May 25, 1981, 56-22334
Term of patent 14 years
U.S. Cl. D10—39

274,411
PROTRACTOR
Fahim R. Sidrak, 4649 Norwich Rd., Wilmington, N.C. 28405
Filed Dec. 10, 1981, Ser. No. 329,620
Term of patent 14 years
U.S. Cl. D10—65

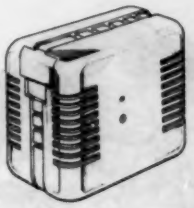


274,412
SURVEYOR'S STAKE
Edward E. Anderson, 9323 Bennett Lake Rd., Fenton, Mich. 48430
Filed Apr. 16, 1981, Ser. No. 254,963
Term of patent 14 years
U.S. Cl. D10—66

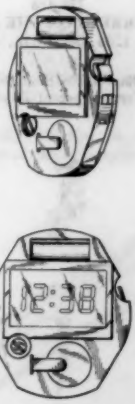
274,413
MICROMETER
Hideo Sakata; Ichiro Mizuno; Masao Nakahara, and Takasi Sanpei, all of Kawasaki, Japan, assignors to Mitutoyo Mfg. Co., Ltd., Tokyo, Japan
Filed Feb. 17, 1982, Ser. No. 349,563
Claims priority, application Japan, Aug. 26, 1981, 56-37656
Term of patent 14 years
U.S. Cl. D10—73

274,414
CENTER FINDER
Edwin F. Audsley, 18 W. Windermere Ter., Lansdowne, Pa. 19050
Filed Apr. 19, 1982, Ser. No. 369,447
Term of patent 14 years
U.S. Cl. D10—73

274,415
PORTABLE SMOKE DETECTOR OR SIMILAR ARTICLE
Benjamin H. Stansbury, Jr., Beverly Hills, and Lanny A. Gorton, Sunland, both of Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Feb. 2, 1982, Ser. No. 344,919
Term of patent 14 years
U.S. Cl. D10—106



274,416
WATCH MODULE
Refael Braun, Woodmere, N.Y., and Chai M. C. Michael, Kwai Chung, Hong Kong, assignors to E. Gluck Corporation, Long Island City, N.Y.
Filed Jan. 18, 1982, Ser. No. 339,896
Term of patent 14 years
U.S. Cl. D10—129



274,417

FACE OF MEDALLION OR THE LIKE

Nicholas Capodilupo, 1550 Worcester Rd., Framingham, Mass. 01701

Filed Jun. 26, 1981, Ser. No. 277,932

Term of patent 14 years

U.S. Cl. D11—105

274,418

EARRING OR THE LIKE

Marilyn M. Bruce, 1206 Dover Dr., Newport Beach, Calif. 92660

Filed Sep. 14, 1981, Ser. No. 302,139

Term of patent 14 years

U.S. Cl. D11—44

274,419

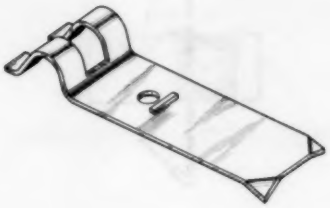
RAILWAY TIE HOLDER

Garwood N. Burwell, Madison, N.J., assignor to The Rails Company, Maplewood, N.J.

Filed Oct. 26, 1981, Ser. No. 314,556

Term of patent 14 years

U.S. Cl. D12—51



274,420

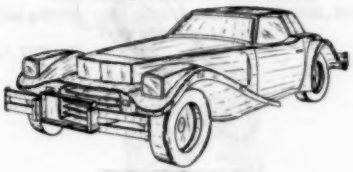
AUTOMOTIVE VEHICLE

Gordon M. Buehrig, Grosse Pointe Woods, Mich., assignor to Buehrig Motor Car Company, Detroit, Mich.

Filed Jan. 22, 1982, Ser. No. 341,766

Term of patent 14 years

U.S. Cl. D12—92



274,421

MOTORCYCLE

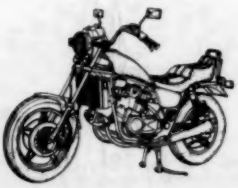
Masato Iwakura, Asaka; Hiroshi Nakano, Tokyo, and Mutsuo Hirose, Niiza, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1982, Ser. No. 357,269

Claims priority, application Japan, Sep. 11, 1981, 56/40262

Term of patent 14 years

U.S. Cl. D12—110



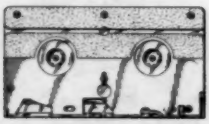
274,422
TIRE
David A. Wright, Louisville, Colo., assignor to The B. F. Goodrich Company, Akron, Ohio
Continuation-in-part of Ser. No. 848,967, Nov. 7, 1977, abandoned. This application Jun. 25, 1981, Ser. No. 277,379
Term of patent 14 years
U.S. Cl. D12—147

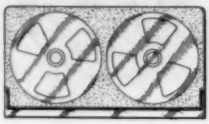
274,423
MOTORCYCLE
Tatsuo Horikoshi, Tokyo, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed Oct. 8, 1980, Ser. No. 194,961
Claims priority, application Japan, Apr. 26, 1980, 55-16808
Term of patent 14 years
U.S. Cl. D12—110

274,424
COMBINED WHEEL AND REMOVABLE DECORATIVE INSERT
Joel C. Cunard, and William H. Ziegler, Jr., both of Bedford, Pa., assignors to Brown Group Recreational Products, Inc., Bedford, Pa.
Division of Ser. No. 227,162, Jan. 22, 1981, Pat. No. Des. 270,344. This application Aug. 11, 1982, Ser. No. 407,162
Term of patent 14 years
U.S. Cl. D12—211

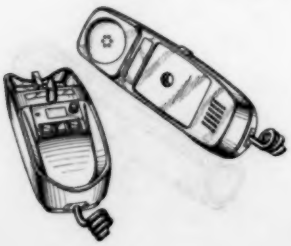
274,425
SPARK CONNECTOR BOOT
Justyn J. Labutski, III, 1557 Hearthstone Dr., San Jose, Calif. 95122
Filed Jul. 20, 1981, Ser. No. 285,159
Term of patent 14 years
U.S. Cl. D13—15

274,426
VIDEO TAPE CASSETTE
Hartmut Thiele, Munich, Fed. Rep. of Germany, assignor to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany
Filed May 14, 1981, Ser. No. 263,779
Claims priority, application Fed. Rep. of Germany, Dec. 1, 1980, 5 MR 597
Term of patent 14 years
U.S. Cl. D14—11

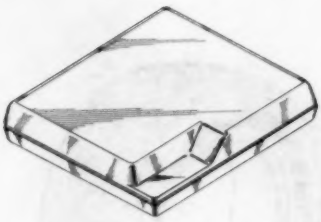




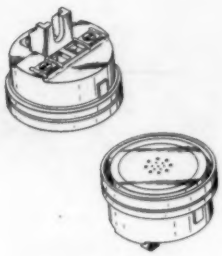
274,427
RADIO TELEPHONE UNIT
Dennis L. Fredrickson, Leawood, Kans., assignor to Fredrickson Communications, Inc., Lenexa, Kans.
Filed Sep. 14, 1981, Ser. No. 301,529
Term of patent 14 years
U.S. Cl. D14—53



274,428
HOUSING FOR AN AUTOMATIC TELEPHONE ALARM SYSTEM
Alfred I. Bottner, Natick, Mass., assignor to United Telecommunications, Inc., Kansas City, Mo.
Filed Nov. 30, 1981, Ser. No. 326,311
Term of patent 14 years
U.S. Cl. D14—59



274,429
TELEPHONE HANDSET TRANSMITTER CUP
Wesley F. Walker, Jr., Ringgold, Ga., assignor to Walker Equipment Corporation, Ringgold, Ga.
Filed Feb. 8, 1982, Ser. No. 346,822
Term of patent 14 years
U.S. Cl. D14—67



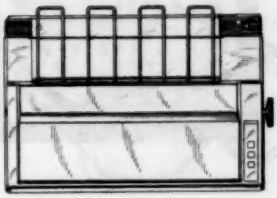
274,430
DESIGN FOR A KEYBOARD CENTRAL PROCESSOR CONTROL
Melvin H. Epstein, Baltimore County, Md., assignor to National Diagnostics Data Corporation, Hunt Valley, Md.
Filed Aug. 4, 1981, Ser. No. 290,093
Term of patent 14 years
U.S. Cl. D14—105

274,431

ELECTRONIC PRINTER

Shunichi Nagaya, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo and Epson Corporation, Nagano, both of, Japan

Filed Mar. 29, 1982, Ser. No. 362,796
Claims priority, application Japan, Sep. 30, 1981, 56/43465
Term of patent 14 years
U.S. Cl. D14—111

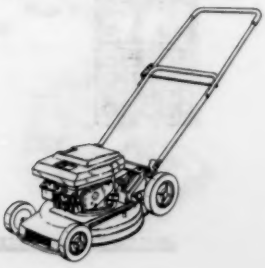


274,432

ROTARY LAWN MOWER

Philip R. Allen, and Terence F. Porter, both of Auckland, New Zealand, assignors to Mazon & Porter Limited, Auckland, New Zealand

Filed Jul. 24, 1980, Ser. No. 171,847
Claims priority, application New Zealand, Apr. 16, 1980, 16510
Term of patent 14 years
U.S. Cl. D15—14

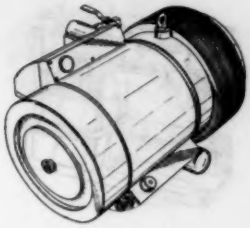


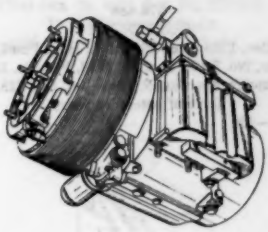
274,433

ROTARY COMPRESSOR

Edward Boller, Halesowen, England, assignor to The Hydrovane Compressor Company, Limited, Worcestershire, England

Filed Jan. 27, 1981, Ser. No. 228,772
Claims priority, application United Kingdom, Jul. 31, 1981, 995967
Term of patent 14 years
U.S. Cl. D15—7



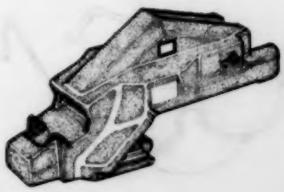


274,434

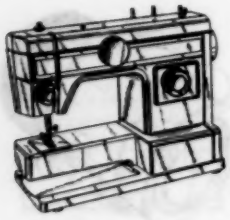
LOADER TOOTH ADAPTERS FOR CORNER ASSEMBLY

Ove Nilsson, Örebro, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed May 20, 1982, Ser. No. 380,304
Claims priority, application Sweden, Nov. 23, 1981, 81-2718
Term of patent 14 years
U.S. Cl. D15—28



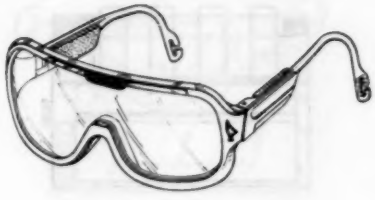
274,435
SEWING MACHINE
Susumu Hanyu, and Masatomo Amamiya, both of Hachioji, Japan, assignors to Janome Sewing Machine Co., Ltd., Tokyo, Japan
Filed Apr. 8, 1981, Ser. No. 252,128
Claims priority, application Japan, Aug. 18, 1980, 55/33474
Term of patent 14 years
U.S. Cl. D15—68



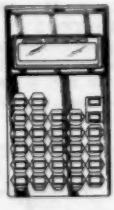
274,436
CUTTER BIT
Will M. Lassiter, 1703 Deep River Rd., High Point, N.C. 27260
Division of Ser. No. 7,100, Jan. 29, 1979, Pat. No. Des. 263,598.
This application Jan. 9, 1981, Ser. No. 223,914
Term of patent 14 years
U.S. Cl. D15—139

274,437
SUNGLASSES
Franz Dianitsch, Linz, Austria, assignor to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed Jul. 9, 1981, Ser. No. 281,653
Term of patent 14 years
U.S. Cl. D16—110

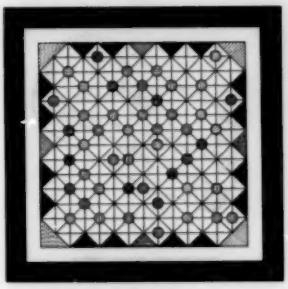
274,438
SPORTS GOGGLE
Gottfried Angerman, Neubofen, Austria, and Juergen R. Goepfert, Darmstadt, Fed. Rep. of Germany, assignors to Optyl Eyewear Fashion International Corporation, Norwood, N.J.
Filed Sep. 8, 1981, Ser. No. 300,004
Term of patent 14 years
U.S. Cl. D16—112



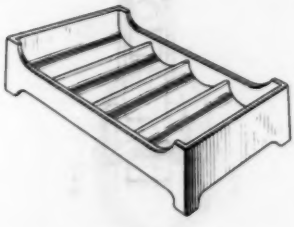
274,439
ELECTRONIC CALCULATOR
Keiji Sakata, and Masafumi Yamagami, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Mar. 24, 1982, Ser. No. 361,495
Term of patent 14 years
U.S. Cl. D18—7



274,440
GAME BOARD
Sharon E. Zeldin, 38506 Calle de la Siesta, Murrieta Hot Springs, Calif. 92362
Filed Oct. 2, 1981, Ser. No. 307,798
Term of patent 14 years
U.S. Cl. D21—34

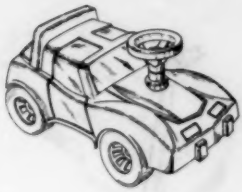


274,441
STACKABLE POKER CHIP HOLDER
Richard L. Stevenson, Minneapolis, Minn., assignor to JAX, Ltd., Minneapolis, Minn.
Filed Jun. 22, 1981, Ser. No. 276,179
Term of patent 14 years
U.S. Cl. D21—56



274,442
TOY AUTOMOBILE
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and George Kress, Scotch Plains, N.J., assignors to Mel Appel, Livingston, N.J.
Filed Jun. 21, 1982, Ser. No. 390,219
Term of patent 14 years
U.S. Cl. D21—78

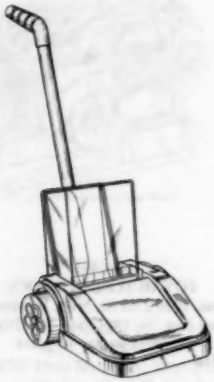
274,443
TOY AUTOMOBILE
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and George Kress, Scotch Plains, N.J., assignors to Mel Appel, Livingston, N.J.
Filed Jun. 21, 1982, Ser. No. 390,228
Term of patent 14 years
U.S. Cl. D21—78



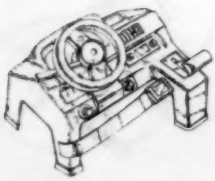
274,444
TOY BUILDING BLOCK
James H. Symons, 2836 27th St. NW., Washington, D.C. 20008
Filed Jun. 26, 1981, Ser. No. 275,954
Term of patent 14 years
U.S. Cl. D21—108

274,445
TOY HOOP ROLLER
Clyde E. Mutch, 2501 Sherman Ave., Coeur d'Alene, Id. 83814
Filed Aug. 10, 1981, Ser. No. 291,236
Term of patent 14 years
U.S. Cl. D21—210

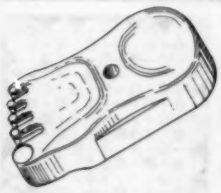
274,446
VACUUM CLEANER ACTION TOY
James K. McIntosh, Somerset, and Robert L. Witkin, Morganville, both of N.J., assignors to Carolina Enterprises, Inc., New York, N.Y.
Filed Feb. 5, 1982, Ser. No. 346,260
Term of patent 14 years
U.S. Cl. D21—122



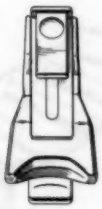
274,447
TOY CAR DASHBOARD
Mel Appel, Nine Nottingham Rd., Livingston, N.J. 07039, and George Kress, Scotch Plains, N.J., assignors to Mel Appel, Livingston, N.J.
Filed May 21, 1982, Ser. No. 380,545
Term of patent 14 years
U.S. Cl. D21—142



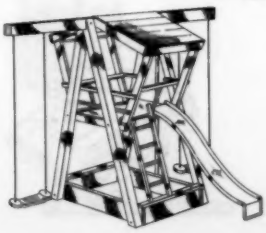
274,448
GOLF PUTTER HEAD
Peter J. Turza, 1040 Hermitage Dr.; Rudolph A. Jansen, 1730 Kent Rd., and Frank P. Turza, 1650 Chippendale Rd., all of Hoffman Estates, Ill. 60195
Filed Jul. 6, 1981, Ser. No. 280,839
Term of patent 14 years
U.S. Cl. D21—215



274,449
HEEL ELEMENT FOR SAFETY SKI BINDING
Hermann R. Segers, Munich, and Herbert H. Schultes, Fürstenfeldbruck, both of Fed. Rep. of Germany, assignors to Marker-Patentverwertungsgesellschaft mbH, Baar, Switzerland
Filed May 18, 1981, Ser. No. 264,717
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1980, MR 12 330
Term of patent 14 years
U.S. Cl. D21—230

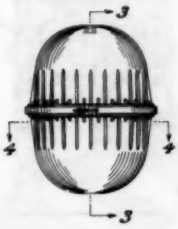


274,450
OUTDOOR CHILD'S PLAY UNIT
Richard F. Gordon, Salt Lake City, Utah, assignor to Sportsplay Creative Enterprises, Inc., Salt Lake City, Utah
Filed Oct. 19, 1981, Ser. No. 312,419
Term of patent 14 years
U.S. Cl. D21—244

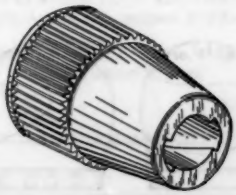


274,451
TENT PEG
Jerrold M. Wolf, 4880 Dogwood Ave., Seal Beach, Calif. 90740
Filed Feb. 16, 1982, Ser. No. 348,856
Term of patent 14 years
U.S. Cl. D21—255

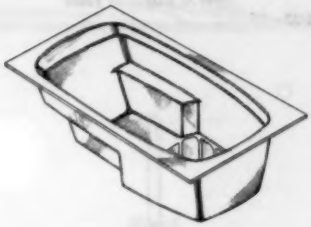
274,452
WATER RESERVOIR FOR A REVERSE OSMOSIS SYSTEM
Bruce D. Burrows, 25145 West Ave. Stanford, Valencia, Calif. 91355
Filed Sep. 15, 1981, Ser. No. 302,463
Term of patent 14 years
U.S. Cl. D23—2



274,453
FEMALE COUPLING AND SEAL UNIT
Jerry R. Hayes, Peoria, Ill., assignor to L. R. Nelson Corp., Peoria, Ill.
Filed Oct. 2, 1981, Ser. No. 307,958
Term of patent 14 years
U.S. Cl. D23—43

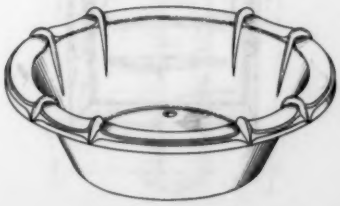


274,454
BATHTUB
David A. Robinson, Fillmore, Calif., assignor to Gruber Systems, Inc., Valencia, Calif.
Filed Mar. 26, 1982, Ser. No. 362,283
Term of patent 14 years
U.S. Cl. D23—55



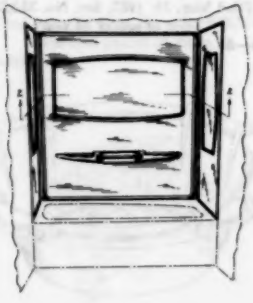
274,455
BATHTUB
Richard J. Cuttriss, Fillmore, Calif., assignor to Gruber Systems, Inc., Valencia, Calif.
Filed Mar. 26, 1982, Ser. No. 362,284
Term of patent 14 years
U.S. Cl. D23—55

274,456
BATHTUB
Richard J. Cuttriss, Fillmore, Calif., assignor to Gruber Systems, Inc., Valencia, Calif.
Filed Mar. 26, 1982, Ser. No. 362,285
Term of patent 14 years
U.S. Cl. D23—55

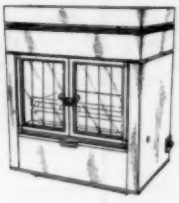


274,457
COMBINED SIDE SHOWER HEADS, HAND SHOWER CONNECTOR AND ADJUSTABLE HOLDER FOR A HAND SHOWER
Andreas Haug, Altensteig, Fed. Rep. of Germany, assignor to Hans Grohe GmbH & Co., Fed. Rep. of Germany
Filed Jul. 9, 1981, Ser. No. 281,629
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1981, 1018 0B
Term of patent 14 years
U.S. Cl. D23—57

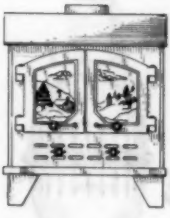
274,458
BATHTUB WALL UNIT
Donald W. Doman, Janesville, Wis., assignor to Kohler Co., Kohler, Wis.
Filed Sep. 28, 1982, Ser. No. 426,208
Term of patent 14 years
U.S. Cl. D23—69



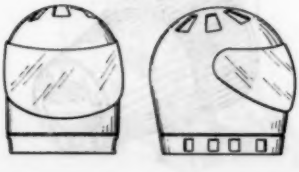
274,459
SOLID FUEL STOVE
Bernard D. Fellows, Kincardine, England, assignor to Smith & Wellstood Limited, Bonnybridge, Scotland
Filed May 17, 1982, Ser. No. 379,263
Claims priority, application United Kingdom, Nov. 27, 1981, 1003872
Term of patent 14 years
U.S. Cl. D23—97



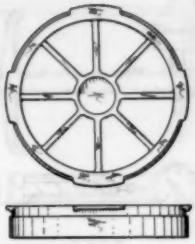
274,460
FREE-STANDING HEATING STOVE
Charles F. Buehler, 6540 Kirkville Rd., E. Syracuse, N.Y. 13057
Filed Jul. 14, 1982, Ser. No. 398,158
Term of patent 14 years
U.S. Cl. D23—97



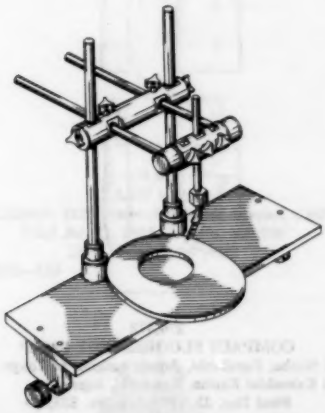
274,461
DISPENSING CONTAINER FOR AIR FRESHENER
Brian S. Minshull, London, England, assignor to Rizla Limited, Glamorganshire, Wales
Filed Apr. 27, 1981, Ser. No. 258,038
Claims priority, application United Kingdom, Oct. 28, 1980, 997276
Term of patent 14 years
U.S. Cl. D23—150



274,462
FILTER CARTRIDGE HOUSING
William J. Rakocy, Madison, and Ronald L. Muller, Old Saybrook, both of Conn., assignors to North American Philips Corporation, New York, N.Y.
Filed May 29, 1981, Ser. No. 268,447
Term of patent 14 years
U.S. Cl. D23—163

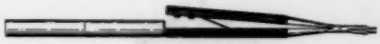


274,463
ADJUSTABLE PATIENT HEADHOLDER BRACKET FOR A RADIOLOGICAL TREATMENT TABLE
Kenneth G. Clark, 1274 W. Wabash, Tucson, Ariz. 85705
Filed Feb. 11, 1982, Ser. No. 347,913
Term of patent 14 years
U.S. Cl. D24—2

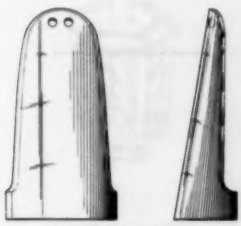


274,464
INOCULATING LOOP AND NEEDLE
LaVerne K. Baitz, Austin, Tex., assignor to K-Loops, Inc., Austin, Tex.
Filed Aug. 30, 1982, Ser. No. 412,558
Term of patent 14 years
U.S. Cl. D24—8

274,465
MICROSURGICAL NEEDLE HOLDER
John A. Davison, 5553 Copeland Pl., San Jose, Calif. 95124
Filed Sep. 14, 1981, Ser. No. 301,808
Term of patent 14 years
U.S. Cl. D24—26



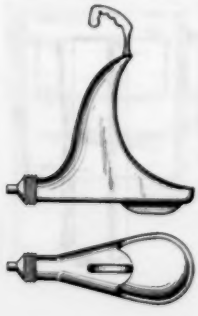
274,466
LABORATORY SHIELD
Daniel R. Conlon, 600 Meetinghouse Rd., Jenkintown, Pa. 19046
Filed Sep. 28, 1983, Ser. No. 536,538
Term of patent 14 years
U.S. Cl. D24—29



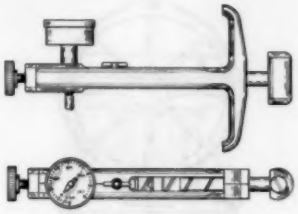
274,467
COMBINED ARTIFICIAL KIDNEY AND HOLDER THEREFOR
Andreas Preussner, 1020 Keith Ave., Berkeley, Calif. 94708
Filed Feb. 8, 1982, Ser. No. 346,434
Term of patent 14 years
U.S. Cl. D24—21

274,468
MASSAGE ROLLER
W. Dean Perry, 1870 Tulip Dr., P.O. Box 5034, Sarasota, Fla. 33579
Filed Jul. 6, 1981, Ser. No. 280,886
Term of patent 14 years
U.S. Cl. D24—36

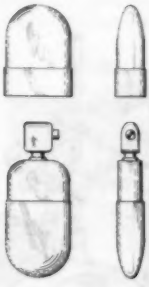
274,469
MEDICAL URINE FUNNEL AND THE LIKE
Tien Huang, 346 Chung-Cheng Rd., Kuan-Mia Village, Tainan; Chi Sheng Tseng, 1 7th Fl., 342 Fu-Shing South Rd., Sec. 1, Taipei, both of Taiwan; Chifuyu Funatsuki, 24-9 Oaza Araki Koaza Tachikawa, Ujitawara-Cho, Tsuzuki-Gun, Tokyo, and Etsudo Tatsumi, 1017-23, Muro-Machi, Ikeda City, Osaka, both of Japan
Filed Jun. 29, 1981, Ser. No. 279,358
Term of patent 14 years
U.S. Cl. D24—54



274,470
INFLATING AND DEFLATING DEVICE FOR VASCULAR DILATING CATHETER ASSEMBLY
Ingemar H. Lundquist, Oakland, Calif., assignor to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.
Filed Oct. 21, 1981, Ser. No. 313,390
Term of patent 14 years
U.S. Cl. D24—54



274,471
ATOMIZER
William Widmer, 83 Beacon Hill Rd., Port Washington, N.Y. 11050
Filed Oct. 2, 1981, Ser. No. 307,896
Term of patent 14 years
U.S. Cl. D24—62



274,472
COMPACT FLUORESCENT LAMP
Masumi Nanba, Funabashi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan
Filed Dec. 23, 1981, Ser. No. 333,889
Claims priority, application Japan, Dec. 18, 1980, 55-52557
Term of patent 14 years
U.S. Cl. D26—3

274,473
DESK LAMP
Peter de Boer, Stationssingel 25, 5103 XK Culemborg, Netherlands
Filed Dec. 3, 1981, Ser. No. 327,183
Term of patent 14 years
U.S. Cl. D26—60

274,474
TABLE LAMP
Achille Castiglioni, Milan, Italy, assignor to Flos S.p.A., Italy
Filed Feb. 5, 1982, Ser. No. 346,242
Claims priority, application Italy, Aug. 11, 1981, 7044/81[U]
Term of patent 14 years
U.S. Cl. D26—93

274,475
LAMP BASE
John W. Caldwell, 1829 Warwick Rd., San Marino, Calif. 91108
Filed Jul. 21, 1982, Ser. No. 400,500
Term of patent 14 years
U.S. Cl. D26—110

274,476
LAMP BASE
John W. Caldwell, 1829 Warwick Rd., San Marino, Calif. 91108
Filed Jul. 21, 1982, Ser. No. 400,501
Term of patent 14 years
U.S. Cl. D26—110

274,477
LAMP BASE
John W. Caldwell, 1829 Warwick Rd., San Marino, Calif. 91108
Filed Jul. 21, 1982, Ser. No. 400,505
Term of patent 14 years
U.S. Cl. D26—110

274,478
LAMP BASE
John W. Caldwell, 1829 Warwick Rd., San Marino, Calif. 91108
Filed Jul. 21, 1982, Ser. No. 400,506
Term of patent 14 years
U.S. Cl. D26—110

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF JUNE, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A Ahlstrom Osakeyhtio: *See*—
Marttala, Tapani; and Saramaki, Kari, 4,456,750, Cl. 536-59.000.

A/S Grorud Jernvarefabrik: *See*—
Johansen, Jan, 4,455,710, Cl. 16-221.000.

A.T.B. S.p.A.: *See*—
Bordignon, Abramo, 4,456,344, Cl. 350-452.000.

Abbott Laboratories: *See*—
Arbir, Francis W.; Raden, Daniel S.; Narducy, Kenneth W.; and Casati, Francois M., 4,456,696, Cl. 502-167.000.
Herrin, Thomas R.; and Thomas, Alford M., 4,456,593, Cl. 424-177.000.
Plattner, Jacob J.; and Fung, Anthony K., 4,456,612, Cl. 424-272.000.
Vcelka, John L.; Pisik, Jay J.; and Hohberger, Clive P., 4,456,009, Cl. 604-152.000.

Abe, Shinya: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,456,603, Cl. 424-248.570.

Abe, Yuzo: *See*—
Yoshioka, Teruo; Naito, Shiro; Abe, Yuzo; and Uchida, Kuninobu, 4,455,734, Cl. 29-434.000.

Abex Corporation: *See*—
Shaw, Edwin L.; and Viles, Alan H., 4,455,920, Cl. 92-12.200.

Abolins, Visvaldis; and Holub, Fred F., to General Electric Company. Flame resistant non-discolored polyphenylene ether resin compositions. 4,456,720, Cl. 524-176.000.

Abts, Leigh R., to Micro Pure Systems, Inc. Ultrasonic probe. 4,455,873, Cl. 73-629.000.

Accumulatorenwerk Hoppecke Carl Zoellner & Sohn GmbH & Co. KG: *See*—
Sperling, Friedrich; and Hennecke, Aloys, 4,455,724, Cl. 29-2.000.

ACF Industries, Incorporated: *See*—
Behle, Gunter R.; and Mingus, Joel A., 4,456,220, Cl. 251-144.000.

Achermann, Heinz: *See*—
Regenass, Willy; Giger, Gerhard; Kuster, Kaspar; and Achermann, Heinz, 4,456,389, Cl. 374-31.000.

Achilles, Louis V., Sr. Chimney sentinel. 4,455,996, Cl. 126-200.000.

Achmatov, Igol: *See*—
Kretschmer, Horst; Fleischer, Klaus; Gohler, Peter; Schingnitz, Manfred; Berger, Friedrich; Jegorow, Aleksander; Fedotov, Vasilij; Gavrilin, Vladimir; Gudymov, Ernest; Semenov, Vladimir; Achmatov, Igol; Majdurov, Nikolaj; and Avraamov, Evgenij, 4,455,949, Cl. 110-263.000.

Acmil Plastic Products Pty. Ltd.: *See*—
Burling, Berkley S., 4,456,142, Cl. 220-4.00F.

Adam, Arthur J. L. Earth boring method and apparatus. 4,456,078, Cl. 175-20.000.

Adams, John B., Jr., to Du Pont de Nemours, E. I., and Company. Pyridyl sulfone herbicides. 4,456,469, Cl. 71-93.000.

Adams, Ronald D.; and Chia, E. Henry, to Southwire Company. Method of hot-forming metals prone to crack during rolling. 4,456,491, Cl. 148-2.000.

Adamse, Jan W. C.; and Van Turnbout, Jan, to Minnesota Mining and Manufacturing Company. Particulate-modified electret fibers. 4,456,648, Cl. 428-283.000.

Adler, Alan J. Gliding ring. 4,456,265, Cl. 273-425.000.

Advanced Micro Devices, Inc.: *See*—
Bayman, Atiye; and Thomas, Mammen, 4,456,501, Cl. 156-643.000.

AEPLC: *See*—
New, Nigel H., 4,456,391, Cl. 384-307.000.

Aerazur EFA: *See*—
Alavoine, Jacques J.; Contensou, Claude; Hardy, Pierre M.; and Neveux, Francis H., 4,456,205. Cl. 244-110.00C.

AGA Aktiebolag: *See*—
Knoos, Stellan, 4,455,826, Cl. 60-526.000.

Agfa-Gavaert Aktiengesellschaft: *See*—
Bochow, Richarda; Bergmann, Helmut; and Eikemeier, Siegfried, 4,456,667, Cl. 430-10.000.

Agius, Joseph L. Apparatus for processing and dispensing fertilizer or insecticide. 4,456,176, Cl. 239-142.000.

Aikawa, Hiroshi, to Nissan Motor Co., Ltd. Suspension arm assembly for supporting automobile wheel. 4,456,274, Cl. 280-96.100.

Airail Systems, Inc.: *See*—
Swensson, Malte, 4,455,945, Cl. 104-23.0FS.

Aisin Seiki Kabushiki Kaisha: *See*—
Kawabata, Yasuhiro; and Aoki, Kongo, 4,456,218, Cl. 251-61.500.

Aisin-Warner K.K.: *See*—
Wayman, Robert W.; Kawamoto, Mutsumi; and Sakakibara, Shiro, 4,455,888, Cl. 74-689.000.

Akebono Brake Industry Co., Ltd.: *See*—
Maehara, Toshifumi, 4,455,831, Cl. 60-574.000.

Aker, Charles M., to Omnithruster, Inc. Fluid valve actuated boat thruster. 4,455,960, Cl. 114-151.000.

Akiba, Shigeyuki: *See*—
Tanaka, Fujio; Okamura, Yasuyuki; Kushiro, Yukitoshi; Ota, Chuichi; and Akiba, Shigeyuki, 4,456,998, Cl. 372-45.000.

Akimoto, Hidetoshi; Kaji, Ryuichi; Komuro, Takeo; Muranaka, Yasushi; Kikuchi, Hideo; Hishinuma, Yukio; Nakajima, Fumito; and Terada, Hiroshi, to Hitachi, Ltd.; and Babcock-Hitachi Kabushiki Kaisha. Process for removing ash from coal. 4,456,528, Cl. 209-49.000.

Akister, James F.: *See*—
Nally, Robert B.; Akister, James F.; Leung, Patrick C.; and Vance, Eric J., 4,457,015, Cl. 382-45.000.

Akita, Shigeyuki: *See*—
Yasuda, Eturo; Akita, Shigeyuki; and Kodera, Masao, 4,456,848, Cl. 310-322.000.

Alavoine, Jacques J.; Contensou, Claude; Hardy, Pierre M.; and Neveux, Francis H., to Aerazur EFA. Aircraft arresting gear net raising device. 4,456,205, Cl. 244-110.00C.

Albanese, Vincent M.; and Keleher, Andrew G., to Nalco Chemical Company. Intermittently applied coating of magnesium hydroxide to boiler tubes to prevent slag and deposit buildup. 4,456,635, Cl. 427-230.000.

Alberta Energy Company Ltd.: *See*—
Lorenz, Gordon; and Gehring, Ken, 4,456,536, Cl. 210-776.000.

Albring, Manfred: *See*—
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,456,600, Cl. 424-238.000.

Alco Standard Corporation: *See*—
Wenzel, Robert J., 4,455,924, Cl. 99-333.000.

Aldridge, Clyde L., to Exxon Research and Engineering Co. High surface area nickel aluminate spinel catalyst for steam reforming. 4,456,703, Cl. 502-335.000.

Aleshina, Zinaida P.: *See*—
Lupova, Ljudmila M.; Fedorova, Lidia G.; Grebeshova, Renata N.; Aleshina, Zinaida P.; Anton, Alexandr G.; Belinsky, Alexandr L.; and Alexeeva, Margarita I., 4,456,544, Cl. 252-174.120.

Alexander, Gabriel G.: *See*—
Roche, Joseph R.; Alexander, Gabriel G.; and Tippit, Larry J., 4,456,062, Cl. 166-84.000.

Alexander, Kenneth E., to GTE Products Corporation. Motor vehicle headlight with contact lug defining adhesive reservoir. 4,456,947, Cl. 362-267.000.

Alexander, Roger D.; and Bates, Andrew J., to ICI Australia Limited. Melt explosive composition. 4,456,492, Cl. 149-8.000.

Alexander Schoeller & Co. AG: *See*—
Manz, Kurt; and Umiker, Hans, 4,455,935, Cl. 101-35.000.

Alexeeva, Margarita I.: *See*—
Lupova, Ljudmila M.; Fedorova, Lidia G.; Grebeshova, Renata N.; Aleshina, Zinaida P.; Anton, Alexandr G.; Belinsky, Alexandr L.; and Alexeeva, Margarita I., 4,456,544, Cl. 252-174.120.

Alfa Romeo Auto S.p.A.: *See*—
Merlini, Luigi; Bassi, Aldo; and Satta, Giuseppe, 4,455,984, Cl. 123-481.000.

Alfred Teves GmbH: *See*—
Seip, Hermann, 4,455,829, Cl. 60-547.100.

Alftine, David N., to Litton Systems, Inc. Molecular sieve oxygen monitor. 4,455,861, Cl. 73-23.000.

Allard, Paul L.; and Sibille, Jacques R., to Muscular Dystrophy Association of Canada, The. Knee joint orthosis. 4,456,003, Cl. 128-80.00F.

Allegheny Ludlum Steel Corporation: *See*—
Deverell, Harry E.; and McCunn, Thomas H., 4,456,483, Cl. 75-128.00N.
Nichol, Thomas J.; and McCunn, Thomas H., 4,456,482, Cl. 75-126.00C.

Allen-Bradley Company: *See*—
Holland, John P., 4,456,800, Cl. 200-5.00A.
Markley, Theodore J.; Galdun, Daniel J.; Clark, Charles E.; Henderson, Robert G.; and Jencen, Frank W., 4,456,315, Cl. 312-137.000.

Allen, Robert J.: *See*—
Kauffman, Ivan L.; and Allen, Robert J., 4,456,118, Cl. 198-480.000.

Allied Corporation: *See*—
Mumford, Robin B., 4,456,335, Cl. 350-331.00R.

Allis-Chalmers Corp.: *See*—
James, Larry R., 4,455,812, Cl. 56-11.500.
Penn, Steven M.; Berti, Jerome L.; and Kovarik, Robert F., Jr., 4,456,268, Cl. 277-106.000.

Aloup, Jean-Claude; Bouchaudon, Jean; Farge, Daniel; and James, Claude, to Rhone-Poulenc Sante. Heterocyclic nitriles. 4,456,758, Cl. 546-284.000.

Alps Electric Co., Ltd.: *See*—
Hori, Fumihisa, 4,455,936, Cl. 101-93.140.
Kano, Mitsuru; Nakanowatari, Jun; and Kamijyo, Yoshimi, 4,456,549, Cl. 252-518.000.
Miyata, Hiroyasu; Ohkita, Masao; Itoh, Akinori; and Minatodani, Shohji, 4,456,155, Cl. 222-396.000.

Altherr, Russell G.; and Kaim, John W., to AMSTED Industries Incorporated. Slackless railway coupler connection. 4,456,133, Cl. 213-62.00R.

Aluminum Company of America: *See*—
Rolf, Richard L.; and Sharp, Maurice L., 4,456,517, Cl. 204-286.000.

Amano, Hisao: *See*—
Matsuda, Yasuo; Honda, Kazuo; Fukui, Hiroshi; Amano, Hisao; and Musha, Shuji, 4,456,836, Cl. 307-252.00C.

Amano, Matsuo: *See*—
Sasayama, Takao; Amano, Matsuo; Hirayama, Takeshi; Sakamoto, Shinichi; and Miki, Masayuki, 4,455,980, Cl. 123-425.000.

Amtac Industries, Incorporated: *See*—
Bullis, Robert H.; Kimberley, John A.; and Couch, Robert P., 4,456,883, Cl. 324-464.000.

Amberkar, Suresh D., to Dennison Manufacturing Company. White electrosensitive paper. 4,456,632, Cl. 427-124.000.

Amcur N.V.: *See*—
van Baal, Petrus H., 4,455,725, Cl. 29-1.300.

Amemiya, Masahiro: *See*—
Hirai, Shigeo; Sueyoshi, Toshinobu; and Amemiya, Masahiro, 4,456,475, Cl. 75-0.5AA.

American Cast Iron Pipe Company: *See*—
Conner, Randall C., 4,456,288, Cl. 285-321.000.

American Cyanamid Company: *See*—
Lewellyn, Morris E., 4,456,560, Cl. 260-455.00A.
Murdock, Keith C.; and Durr, Frederick E., 4,456,552, Cl. 260-377.000.

American Standard Inc.: *See*—
Scott, Daniel G.; and Ferry, Gene S., 4,456,219, Cl. 251-99.000.

Ames, William A., to Eastman Kodak Company. Terpolymer compositions useful as pressure-sensitive adhesives. 4,456,741, Cl. 526-264.000.

Ammermann, Eberhard: *See*—
Sauter, Hubert; Ammermann, Eberhard; Rentzea, Costin; and Pommer, Ernst-Heinrich, 4,456,608, Cl. 424-269.000.

AMP Incorporated: *See*—
McCleerey, Earl W., 4,456,317, Cl. 339-14.00R.
Toeppen, Thurston H., 4,455,745, Cl. 30-90.600.

Ampex Corporation: *See*—
Brown, Hugh B., 4,456,877, Cl. 324-77.00K.

AMSTED Industries Incorporated: *See*—
Altherr, Russell G.; and Kaim, John W., 4,456,133, Cl. 213-62.00R.

Amtrol Inc.: *See*—
Pompei, Francesco, 4,456,456, Cl. 55-203.000.

Anderson, Alfred J., to Atlantic Richfield Company. Method of forming structural heliostat. 4,456,332, Cl. 350-320.000.

Anderson, Arnold E.: *See*—
Melotik, Donald J.; Weintraub, Marvin H.; and Anderson, Arnold E., 4,456,650, Cl. 428-290.000.

Anderson, Bradley D.; and Conradi, Robert A., to Upjohn Company, The. Amine containing ester prodrugs of corticosteroids. 4,456,602, Cl. 424-243.000.

Anderson, Herbert R., Jr.; Araps, Constance J.; and Lotsko, Catherine A., to International Business Machines Corporation. Dry process for forming metal patterns wherein metal is deposited on a depolymerizable polymer and selectively removed. 4,456,675, Cl. 430-256.000.

Anderson, John P., to Hartwell Corporation. Hinge having a laterally outwardly extending flat spring. 4,455,711, Cl. 16-229.000.

Anderson, Keith. Analyser for electromotive device. 4,456,874, Cl. 324-51.000.

Andis Company: *See*—
Andis, Matthew L., 4,456,815, Cl. 219-225.000.

Andis, Matthew L., to Andis Company. Removable hair grooming attachment for a curling iron. 4,456,815, Cl. 219-225.000.

Ando, Haruhisa: *See*—
Aoki, Masakazu; Ando, Haruhisa; Ohba, Shinya; and Takemoto, Iwao, 4,456,929, Cl. 358-213.000.

Ando, Masao, to Chisso Engineering Co. Ltd. Electrically heated reactor for high temperature and pressure chemical reactions. 4,456,186, Cl. 219-300.000.

Andrews, Richard L. Swing propelling foot rest. 4,456,244, Cl. 272-92.000.

Anezaki, Shoji: *See*—
Masuda, Seiichi; Matsuo, Tohru; Ohkita, Yoshimichi; Aoki, Takeo; Nakajima, Hidemasa; Okamura, Shozo; Hirata, Takeyuki; and Anezaki, Shoji, 4,456,477, Cl. 75-51.000.

Angiomedics Corporation: *See*—
Schjeldahl, C[3]lmore T.; and Sharma, B., 4,456,000, Cl. 128-1.00D.

Anic S.p.A.: *See*—
Caporossi, Adolfo; and Del Signore, Leonello, 4,456,731, Cl. 525-61.000.

Ansegarn, Marcellinus J. J. C.; and Heijnemans, Werner A. L., to U.S. Philips Corporation. Color television display device comprising a plurality of picture display tubes. 4,456,923, Cl. 358-64.000.

Anspach, Walter: *See*—
Botzem, Werner; Laug, Reiner; Kroll, Hartmut; Schlich, Elmar; Anspach, Walter; Brendel, Karl; and Srostlik, Peter, 4,456,827, Cl. 250-506.100.

Antal, Leonard L.; and Toops, Richard A. Board game. 4,456,259, Cl. 273-256.000.

Anton, Alexandr G.: *See*—
Lupova, Ljudmila M.; Fedorova, Lidia G.; Grebeshova, Renata N.; Aleshina, Zinaida P.; Anton, Alexandr G.; Belinsky, Alexandr L.; and Alexeeva, Margarita I., 4,456,544, Cl. 252-174.120.

Aoki, Kongo: *See*—
Kawabata, Yasuhiro; and Aoki, Kongo, 4,456,218, Cl. 251-61.500.

Aoki, Masakazu; Ando, Haruhisa; Ohba, Shinya; and Takemoto, Iwao, to Hitachi, Ltd. Solid state image pick-up apparatus. 4,456,929, Cl. 358-213.000.

Aoki, Takeo: *See*—
Masuda, Seiichi; Matsuo, Tohru; Ohkita, Yoshimichi; Aoki, Takeo; Nakajima, Hidemasa; Okamura, Shozo; Hirata, Takeyuki; and Anezaki, Shoji, 4,456,477, Cl. 75-51.000.

Apel, William A.: *See*—
Dugan, Patrick R.; and Apel, William A., 4,456,688, Cl. 435-267.000.

Apffel, Fred P., to Flexivol, Inc. Process for recovering ethane, propane and heavier hydrocarbons from a natural gas stream. 4,456,460, Cl. 62-26.000.

Apissomian, Arthur A., to Homecrest Industries Incorporated. Furniture construction. 4,456,301, Cl. 297-445.000.

Applied Diesel Engineering, Inc.: *See*—
Shinaver, Lawrence P., 4,456,529, Cl. 210-306.000.

Arakaki, Masaharu: *See*—
Nakatani, Keiji; and Arakaki, Masaharu, 4,457,008, Cl. 377-18.000.

Aranyi, Peter: *See*—
Toth, Jozsef; Hajos, Gyorgy; Fekete, Gyorgy; Horvath, Istvan; Szporny, Laszlo ; Boor nee Mezei, Anna; Aranyi, Peter; Naray, Aniko; Gorog, Sandor; Holly, Sandor; and Molnar, Csaba, 4,456,601, Cl. 424-241.000.

Araoka, Toshinobu, to Toyo Denki Kogyosho Co., Ltd. Underwater sand pump. 4,456,424, Cl. 415-121.00G.

Araps, Constance J.: *See*—
Anderson, Herbert R., Jr.; Araps, Constance J.; and Lotsko, Catherine A., 4,456,675, Cl. 430-256.000.

Arbed S.A.: *See*—
Mathgen, Georges; Scherer, Robert; Prum, Charles; and Leick, Roger, 4,457,002, Cl. 373-95.000.
Metz, Paul; and Melan, Corneille, 4,456,478, Cl. 75-53.000.

Arbir, Francis W.; Raden, Daniel S.; Narducy, Kenneth W.; and Casati, Francois M., to Abbott Laboratories. Catalyst for making polyurethanes. 4,456,696, Cl. 502-167.000.

Arceneaux, Milton G., Jr. Triangle. 4,455,760, Cl. 33-482.000.

Ariga, Nagao: *See*—
Nambu, Junji; Yoshino, Kenji; Ariga, Nagao; Shimazu, Kyotaro; and Sato, Hiroyuki, 4,456,732, Cl. 525-65.000.

Arimatsu, Toshio, to Sumitomo Rubber Industries, Ltd. Method and apparatus for the high frequency preheating of elastomeric products. 4,456,806, Cl. 219-10.55M.

Ariniello, Robert M., to Storage Technology Corporation. Pneumatic monitoring system for a magnetic tape drive. 4,456,200, Cl. 242-185.000.

Armco Inc.: *See*—
Neiheisel, Gary L.; and Schoen, Jerry W., 4,456,812, Cl. 219-121.0LM.

Armstrong International, Inc.: *See*—
Miner, David W.; Driscoll, Mark D.; Sorenson, John E.; Kirchner, Robert T.; and Keech, David A., 4,456,173, Cl. 237-67.000.

Armstrong World Industries, Inc.: *See*—
Colyer, Timothy D., 4,456,643, Cl. 428-156.000.

Arns, James A.; Edwards, Timothy J.; Moss, Gaylord E.; and Wreede, John E., to Hughes Aircraft Company. Systems for forming improved diffusion holograms. 4,456,328, Cl. 350-3.600.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; and Sugihara, Taisuke, 4,456,757, Cl. 546-139.000.
Katsumata, Tsutomu; Dozono, Tetsuro; and Honda, Makoto, 4,456,563, Cl. 260-465.80R.
Murakami, Masahiro; Kobayashi, Masateru; Yamamoto, Kimiyo; and Shibuya, Chisei, 4,456,754, Cl. 544-21.000.
Nakamura, Shohei; and Tuji, Yoshimasa, 4,456,680, Cl. 430-258.000.

Asai, Toshihiro: *See*—
Inoue, Kimio; Fukui, Tsugushi; Asai, Toshihiro; Nakagawa, Kazuhiko; and Kuriyama, Akimasa, 4,456,381, Cl. 366-97.000.

Asakura, Osamu: *See*—
Nozaki, Mineo; Asakura, Osamu; Nagashima, Masasumi; and Iwakura, Sadao, 4,456,392, Cl. 400-120.000.

Asayama, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Electronic control type fuel injection apparatus. 4,455,985, Cl. 123-494.000.

Ashai Optical Co., Ltd.: *See*—
Umetsu, Junji, 4,455,723, Cl. 24-647.000.

Ashland Oil, Inc.: *See*—
Carlos, Donald D.; Gannon, Charles R.; and Wombles, Robert H., 4,456,523, Cl. 208-5.000.
Goel, Anil B.; and Grimm, Robert A., 4,456,555, Cl. 260-410.000.
Wombles, Robert H.; Gannon, Charles R.; and Carlos, Donald D., 4,456,524, Cl. 208-5.000.

Ashley, R. B.; and Kamer, Glenn E. Sight mount device. 4,455,776, Cl. 42-1.0ST.

Assanah, Albert A.; Assanah, Fitzroy; and Assanah, George G. Portable gravity bath. 4,455,696, Cl. 4-584.000.

Assanah, Fitzroy: *See*—
Assanah, Albert A.; Assanah, Fitzroy; and Assanah, George G., 4,455,696, Cl. 4-584.000.

Assanah, George G.: *See*—
Assanah, Albert A.; Assanah, Fitzroy; and Assanah, George G., 4,455,696, Cl. 4-584.000.

Astero, Ulf J., to Optik Innovation AB OIAB. Method in producing a mould for a lens. 4,455,893, Cl. 76-107.00R.

Astill, Mark E.: *See*—
Witty, Thomas R.; and Astill, Mark E., 4,456,689, Cl. 436-500.000.

AT&T Bell Laboratories: *See*—
Kolodner, Paul R., 4,455,741, Cl. 29-574.000.

AT&T Technologies, Inc.: *See*—
Haymaker, James R., 4,456,876, Cl. 324-77.00R.
Lin, Wen, 4,456,499, Cl. 156-605.000.

Atago, Takeshi; and Manaka, Toshio, to Hitachi, Ltd. Engine rotation speed control system. 4,455,978, Cl. 123-339.000.

Atlantic Pacific Marine Corporation: *See*—
Evans, Darrell L., 4,456,404, Cl. 405-196.000.

Atlantic Richfield Company: *See*—
Anderson, Alfred J., 4,456,332, Cl. 350-320.000.
Miller, Richard F.; and Go, Ting S. L., 4,456,526, Cl. 208-48.0AA.

Atlas Electronics International, Inc.: *See*—
Miller, Albert J., 4,456,084, Cl. 177-141.000.

Augat Inc.: *See*—
Roberts, Harold A.; and Wey, Robert A., 4,456,159, Cl. 225-96.500.

Augustine, C. F., to Microwave Sensors, Inc. Frequency modulated continuous wave altimeter. 4,456,911, Cl. 343-5.0PD.

Automatic Connector, Inc.: *See*—
Pitcher, William E.; Baione, Peter W.; and Morelli, John A., 4,456,323, Cl. 339-177.00R.

Automatic Hydraulic Devices: *See*—
Palmer, Guy V.; and Schihl, Raymond J., 4,456,121, Cl. 198-750.000.

Avco Corporation: *See*—
Janik, Stanley G.; and Rumford, Kimball J., 4,455,821, Cl. 60-39.091.

Avco Everett Research Laboratory, Inc.: *See*—
Hella, Richard A.; and Staal, John V., 4,456,811, Cl. 219-121.0LM.

Avraamov, Evgenij: *See*—
Kretschmer, Horst; Fleischer, Klaus; Gohler, Peter; Schingnitz, Manfred; Berger, Friedrich; Jegorow, Aleksander; Fedotov, Vasilij; Gavrilin, Vladimir; Gudymov, Ernest; Semenov, Vladimir; Achmatov, Igol; Majdurov, Nikolaj; and Avraamov, Evgenij, 4,455,949, Cl. 110-263.000.

AVX Corporation: *See*—
Scranton, DeHart G., 4,455,735, Cl. 29-564.100.

Axle Surgeons, Inc.: *See*—
Shiets, Leo C., 4,455,732, Cl. 29-402.060.

Ayasli, Yalcin, to Raytheon Company. Radio frequency network having plural electrically interconnected field effect transistor cells. 4,456,888, Cl. 330-277.000.

Azuma, Masaaki: *See*—
Miyashita, Shunitsu; Azuma, Masaaki; and Somemiya, Akiyoshi, 4,456,736, Cl. 525-392.000.

B. F. Goodrich Company, The: *See*—
Mahler, Carl P. B., II, 4,456,382, Cl. 366-276.000.

Baasch, Holger J.; Bishop, Ross W.; Charlson, Paul M.; Hunzeker, James G.; and Schwieters, Clarence R., to International Business Machines Corporation. Manufacturing apparatus for adjusting the position of a magnetic head in a flexible disk drive. 4,456,938, Cl. 360-109.000.

Babcock-Hitachi Kabushiki Kaisha: *See*—
Akimoto, Hidetoshi; Kaji, Ryuichi; Komuro, Takeo; Muranaka, Yasushi; Kikuchi, Hideo; Hishinuma, Yukio; Nakajima, Fumito; and Terada, Hiroshi, 4,456,528, Cl. 209-49.000.

Babcock & Wilcox Company, The: *See*—
Durrant, Oliver W., 4,455,835, Cl. 60-659.000.
Robertson, John W., Jr.; and Smith, James M., 4,456,865, Cl. 318-599.000.

Baber, R. Richard, to Burlington Industries, Inc. Load support flanges with coined edges. 4,456,129, Cl. 211-13.000.

Bacharach, Ottmar, to Gebr. Pfeiffer AG. Seal arrangement for pull rods in rolling mills. 4,456,267, Cl. 277-30.000.

Backer, Lothar: *See*—
Dhein, Rolf; Backer, Lothar; and Schoeps, Jochen, 4,456,729, Cl. 524-542.000.

Bacon, David C.: *See*—
Jones, Gary A.; Bacon, David C.; and Pooley, Monte A., 4,456,809, Cl. 219-108.000.

Bacroix, Marcel; Menini, Joseph; and Lagoutte, Serge, to Pont-A-Mousson S.A. Tap device for container treatment installation particularly for carbonated beverage bottles. 4,456,040, Cl. 141-150.000.

Badiali, John A., to Metra Electronics Corporation. Add-on locking mechanism for a vehicle hood. 4,456,289, Cl. 292-28.000.

Bahr, Theodor: *See*—
Suttinger, Richard; Bottger, Ernst; Henrich, Hans O.; Bahr, Theodor; and Thumm, Helmut, 4,456,182, Cl. 241-46.020.

Baione, Peter W.: *See*—
Pitcher, William E.; Baione, Peter W.; and Morelli, John A., 4,456,323, Cl. 339-177.00R.

Baker International Corporation: *See*—
Swift, Edward R., Jr.; and Echols, John B., 4,456,061, Cl. 166-75.00R.

Baker, James G., to Polaroid Corporation. Multielement optical panel. 4,456,783, Cl. 136-246.000.

Baker, William E.; Froehlich, Fritz E.; and Mattes, Hans G., to Bell Telephone Laboratories, Incorporated. Cordless telephone system. 4,456,793, Cl. 179-99.00R.

Balaban, Alvin R.; and Steckler, Steven A., to RCA Corporation. Reduced data rate comb filter system. 4,456,922, Cl. 358-31.000.

Balaz, Anton, to Plaspack Kunststoff GmbH & Co. KG. Tennis ball rebound practice net. 4,456,251, Cl. 273-29.00A.

Baldwin, Dan D., to Nautilus Sports/Medical Industries, Inc. Rotary torso exercise apparatus. 4,456,245, Cl. 272-118.000.

Balitskaya, Oxana V., administrator: *See*—
Patoe, Boris E.; Samilov, Vladimir N.; Ivaschenko, Grigory P.; Krasjukov, Alexandr V.; and Balitsky, Vladimir M., deceased, 4,455,852, Cl. 72-82.000.

Balitsky, Vladimir M., deceased: *See*—
Paton, Boris E.; Samilov, Vladimir N.; Ivaschenko, Grigory P.; Krasjukov, Alexandr V.; and Balitsky, Vladimir M., deceased, 4,455,852, Cl. 72-82.000.

Balland, Jean, to Manufacture de Produits Chimiques Protex. Method of oxidizing and simultaneously fixing sulfur dyestuffs on cellulosic fibers. 4,456,453, Cl. 8-554.000.

Ballard, Thomas B. Adjustable welding furnace. 4,456,819, Cl. 219-391.000.

Balle, Gerhard; and Rasshofer, Werner, to Bayer Aktiengesellschaft. Polymer modified polyamines and a process for their preparation. 4,456,730, Cl. 524-839.000.

Ban, Vladimir S.; and Poliniak, Eugene S., to RCA Corporation. Method of applying high-density information record lubricants. 4,456,636, Cl. 427-240.000.

Bandoh, Masaichi: *See*—
Tomita, Katsuhiko; Shimizu, Tetsuo; and Bandoh, Masaichi, 4,456,919, Cl. 357-28.00A.

Barber, Lois M.; and Jackson, William H., to L M B Hand Rehab Products. Spring metacarpophalangeal flexion splint (knuckle splint). 4,456,002, Cl. 128-77.000.

Barker, Derek, to British Petroleum Company Limited, The. Fluidized bed combustor. 4,455,969, Cl. 122-4.00D.

Barna, Alex J. Pulley for compound bow. 4,455,990, Cl. 124-86.000.

Barnes, Michael W.; Kristofferson, Clifford E.; and Manzara, Anthony P., to Thiokol Corporation. Low vulnerability gun propellant. 4,456,493, Cl. 149-19.400.

Baron, Stanley N.: *See*—
Kruger, Robert A.; Baron, Stanley N.; and Liu, Ping Y., 4,456,926, Cl. 358-111.000.

Barozzi, Gian P.; and Horeschi, Giancarlo, to Tokyo Juki Industrial Co., Ltd. Platen knob device of typewriter. 4,456,395, Cl. 400-559.100.

Barrigar, Robert H. Motor vehicle testing apparatus. 4,455,866, Cl. 73-117.000.

Barton, Norman P., to United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in Her Britannic Majesty's Government of the. Elevation protractor for trunnioned guns. 4,455,918, Cl. 89-41.00L.

Basey, Otis J.: *See*—
Knoedler, Roy E.; and Basey, Otis J., 4,456,302, Cl. 297-488.000.

BASF Aktiengesellschaft: *See*—
Eilingsfeld, Heinz; Etzbach, Karl-Heinz; Hoffmann, Gerhard; and Neumann, Peter, 4,456,672, Cl. 430-59.000.
Leyrer, Reinhold J.; and Saenger, Dietrich, 4,456,679, Cl. 430-326.000.
Marosi, Laszlo; Stabenow, Joachim; and Schwarzmann, Matthias, 4,456,582, Cl. 423-277.000.
Sauter, Hubert; Ammermann, Eberhard; Rentzea, Costin; and Pommer, Ernst-Heinrich, 4,456,608, Cl. 424-269.000.
Schoettle, Klaus; Ilmer, Andreas; and Flohr, Joachim, 4,456,160, Cl. 226-195.000.

BASF Wyandotte Corporation: *See*—
Iyengar, Doreswamy R., 4,456,485, Cl. 106-288.00Q.

Basol, Bulent M., to Monosolar, Inc. Method of forming ohmic contacts. 4,456,630, Cl. 427-88.000.

Bassett, Alvin L. Table saw having laterally adjustable saw. 4,455,907, Cl. 83-438.000.

Bassi, Aldo: *See*—
Merlini, Luigi; Bassi, Aldo; and Satta, Giuseppe, 4,455,984, Cl. 123-481.000.

Batchelar, Ian Howard: *See*—
Brown, Maurice L., 4,455,979, Cl. 123-407.000.

Bates, Andrew J.: *See*—
Alexander, Roger D.; and Bates, Andrew J., 4,456,492, Cl. 149-8.000.

Bates, David J.: *See*—
Robinder, Ronald C.; Bates, David J.; and Denham, Dan F., 4,456,853, Cl. 313-421.000.

Bates, Roger J.: *See*—
Whitehead, Graham K.; and Bates, Roger J., 4,456,331, Cl. 350-96.230.

Bauer, Edward J.: *See*—
Lasky, Robert; Lobach, Donald C.; and Bauer, Edward J., 4,456,804, Cl. 219-10.430.

Bauer, Kurt H.; and Osterwald, Hermann. Process for film-coating a particulate solid, and emulsions for conducting the process. 4,456,628, Cl. 427-3.000.

Bauer, Lothar: *See*—
Stadler, Hans; Bauer, Lothar; and Strusch, Wolfgang, 4,455,973, Cl. 123-41.760.

Baumgartner, Hans: *See*—
Sudbeck, Rainer; Baumgartner, Hans; and Schmitz, Eckehard, 4,455,987, Cl. 123-569.000.

Baur, Fred G.: *See*—
Keller, Joseph H.; and Baur, Fred G., 4,456,702, Cl. 502-314.000.

Bausch & Lomb Incorporated: *See*—
Council, Buford W., Jr., 4,455,901, Cl. 82-12.000.

Baxter Travenol Laboratories, Inc.: *See*—
Thomas, William R., 4,456,591, Cl. 424-101.000.

Bayer Aktiengesellschaft: *See*—
Balle, Gerhard; and Rauhofer, Werner, 4,456,730, Cl. 524-839.000.
Bonse, Gerhard; and Schmidt, Thomas, 4,456,769, Cl. 564-226.000.
Burgdorfer, Hans-Heribert; Schapel, Dietmar; Schneider, Gottfried; von Bonin, Wulf; and von Gizycki, Ulrich, 4,456,642, Cl. 428-68.000.
Dhein, Rolf; Backer, Lothar; and Schoeps, Jochen, 4,456,729, Cl. 524-542.000.
Eimers, Erich; Dhein, Rolf; and Kircher, Klaus, 4,456,717, Cl. 524-109.000.
Findeisen, Kurt; and Schwarz, Herbert, 4,456,565, Cl. 260-545.00R.
Hille, Lothar; Ludke, Heimo; and Hansjosten, Nikolaus, 4,456,707, Cl. 521-99.000.
Kubitza, Werner; and Mennickes, Gerhard, 4,456,658, Cl. 428-424.600.
Lindner, Christian; and Ott, Karl-Heinz, 4,456,734, Cl. 525-310.000.
Marzolph, Gerhard; and Blank, Heinz U., 4,456,772, Cl. 568-424.000.
Petruck, Gerd-Michael; Wambach, Paul R., deceased; and Wissner, Adolf, 4,456,777, Cl. 568-937.000.
Richter, Roland; Hettel, Hans; and Muller, Hanns P., 4,456,709, Cl. 521-160.000.
Rottmaier, Ludwig; Merten, Rudolf; Siebourg, Wolfgang; and Lachmann, Burkhard, 4,456,715, Cl. 524-100.000.
Schonfelder, Manfred; Steinberger, Helmut; and Schmid, Helmut, 4,456,647, Cl. 428-216.000.
Walz, Klaus; Schafer, Karl; Hoffarth, Gunther; and Schulze, Hans, 4,456,554, Cl. 260-403.000.

Bayle-Laboure, Gerard J. P.; Buisson, Mark F. B.; Linstrumelle, Roger B.; and Pachot, Jean-Claude, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Device to ignite fuel injected in a rapidly flowing gaseous medium. 4,455,822, Cl. 60-39.822.

Bayman, Atiye; and Thomas, Mammen, to Advanced Micro Devices, Inc. Process for dislocation-free slot isolations in device fabrication. 4,456,501, Cl. 156-643.000.

Bazin, George L., II: *See*—
Terhune, Robert D.; Bazin, George L., II; Long, James H.; and Nguyen, Linh V., 4,455,761, Cl. 34-14.000.

BBC Brown, Boveri & Company, Limited: *See*—
Bellati, Hans, 4,456,426, Cl. 415-219.00R.
Matt, Bernhard; Woringer, Theo; and Zouzoulas, Gerassime, 4,455,840, Cl. 60-737.000.

Beasley, John K.; and Urban, Edward J., to Du Pont de Nemours, E. I., and Company. Electrical cable insulated with a tree-resistant ethylene polymer composition. 4,456,655, Cl. 428-383.000.

Beasom, James D., to Harris Corporation. Isolated gate JFET structure. 4,456,918, Cl. 357-22.000.

Beck, Laurence A.: *See*—
Finley, David R.; and Beck, Laurence A., 4,456,093, Cl. 182-2.000.

Becker, Wilfried; Pepina, Oswald; and Landmann, Manfred, to Messerschmitt-Bolkow-Blohm GmbH. Device for separating the solid charge residues in a pyrotechnic regulating unit. 4,455,944, Cl. 102-530.000.

Becton Dickinson and Company: *See*—
Witty, Thomas R.; and Astill, Mark E., 4,456,689, Cl. 436-500.000.

Beekes, Huibertus A. Handle and reseal for flanged bottle. 4,456,135, Cl. 215-100.00A.

Beer, Robert E.: *See*—
Kaufmann, Kenneth M.; Lundstrom, Robert W.; and Beer, Robert E., 4,456,355, Cl. 354-299.000.

Behle, Gunter R.; and Mingus, Joel A., to ACF Industries, Incorporated. Nozzle assembly for top operating rod. 4,456,220, Cl. 251-144.000.

Beiersdorf Aktiengesellschaft: *See*—
Pietsch, Hanns; Hohmann, Volker; and Eckloff, Willi, 4,456,711, Cl. 523-206.000.

Beig, Willy, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Rotation reversing switch for motor vehicle gear units. 4,455,885, Cl. 74-477.000.

Beisang, Arthur A.: *See*—
Holman, Daniel G.; and Beisang, Arthur A., 4,456,589, Cl. 424-95.000.

Beisswenger, Thomas: *See*—
Effenberger, Franz; and Beisswenger, Thomas, 4,456,766, Cl. 560-17.000.

Belgard, Truly M. Hose bib cover. 4,456,027, Cl. 137-375.000.

Belinsky, Alexandr L.: *See*—
Lupova, Ljudmila M.; Fedorova, Lidia G.; Grebeshova, Renata N.; Aleshina, Zinaida P.; Anton, Alexandr G.; Belinsky, Alexandr L.; and Alexeeva, Margarita I., 4,456,544, Cl. 252-174.120.

Belisomi, Pietro, to Indesit Industria Elettrodomestici Italiana S.p.A. Television tuning system with means to prevent loss of information during power outages. 4,457,021, Cl. 455-186.000.

Bell, Allyn R.: *See*—
Doweyko, Arthur M. P.; Regis, Richard R.; and Bell, Allyn R., 4,456,470, Cl. 71-94.000.

Bell & Howell Company: *See*—
Hams, Kenneth A., 4,456,127, Cl. 209-564.000.
Westover, Dwight G., 4,456,193, Cl. 242-75.420.

Bell Telephone Laboratories, Incorporated: *See*—
Baker, William E.; Froehlich, Fritz E.; and Mattes, Hans G., 4,456,793, Cl. 179-99.00R.
Courtney-Pratt, Jeofry S., 4,456,792, Cl. 179-18.0BC.
Gersho, Allen; and Lawrence, Victor B., 4,457,004, Cl. 375-67.000.
Haas, Lawrence J.; Klibbe, Arthur W.; and Perez-Mendez, Pedro L., 4,456,996, Cl. 371-37.000.
Soyack, Richard F. J., 4,456,790, Cl. 179-18.0ES.

Bellati, Hans, to BBC Brown, Boveri & Company, Limited. Fastening device for a turbine housing. 4,456,426, Cl. 415-219.00R.

Bellman, Robert A.: *See*—
McPherson, Malcolm J.; and Bellman, Robert A., 4,455,876, Cl. 73-747.000.

Beloit Corporation: *See*—
Bollani, Umberto F., 4,456,502, Cl. 162-133.000.

Ben Clements & Sons, Inc.: *See*—
Furutsu, Akira, 4,456,162, Cl. 227-67.000.

Bendix Corporation, The: *See*—
Gaiser, Robert F.; Lohraff, Larry G.; and Myers, Lawrence R., 4,455,830, Cl. 60-562.000.
Gaiser, Robert F.; Lohraff, Larry G.; and Myers, Lawrence R., 4,455,832, Cl. 60-581.000.
Gallusser, David O.; MacAvoy, David W.; Punako, Stephen; and Frear, David L., 4,456,320, Cl. 339-94.00M.
Gongwer, Calvin A., 4,455,962, Cl. 114-312.000.
Klinger, Roland W., 4,456,856, Cl. 315-408.000.

Benjamin, Harry L., to Centro Corporation. Position sensing device. 4,455,754, Cl. 33-174.00L.

Benjamin, Mary L.; Dobbs, Robert J.; and Shaffer, Mary E., to GTE Products Corporation. Process for producing refractory powder. 4,456,484, Cl. 75-252.000.

Bentley Laboratories, Inc.: *See*—
Ebling, Wendell V., 4,456,223, Cl. 251-342.000.

Benz, Reinhard, to Sotax AG. Electrical connection device. 4,456,325, Cl. 339-256.0RT.

Bercha, Frank G.: *See*—
O'Rourke, J. Cam; Marshall, Robert E.; Bercha, Frank G.; and Pilkington, G. Roger, 4,455,958, Cl. 114-40.000.

Bereziat, Claude A., to Manufacture Lyonnaise de Bouchage. Closure having gripping ring means for opening. 4,456,138, Cl. 215-232.000.

Berger, Friedrich: *See*—
Kretschmer, Horst; Fleischer, Klaus; Gohler, Peter; Schingnitz, Manfred; Berger, Friedrich; Jegorow, Aleksander; Fedotow, Vasilij; Gavrilin, Vladimir; Gudymov, Ernest; Semenov, Vladimir; Achmatov, Igol; Majdurov, Nikolaj; and Avraamov, Evgenij, 4,455,949, Cl. 110-263.000.

Bergmann, Helmut: *See*—
Bochow, Richarda; Bergmann, Helmut; and Eikemeier, Siegfried, 4,456,667, Cl. 430-10.000.

Bergmans, Charles, to Clarks of England, Inc. Shoe construction. 4,455,767, Cl. 36-83.000.

Bergsoe, Svend, to Paul Bergsoe & Son A/S. Apparatus for refining lead. 4,456,231, Cl. 266-215.000.

Bernhard, Horst, to Merck Patent Gesellschaft mit beschrankter Haftung. Yellow nacreous pigments having calcined CR oxide and phosphate layer for improved light-fastness, process and use. 4,456,486, Cl. 106-291.000.

Berselli, Orlando: *See*—
Grilli, Walter; Crotti, Aldo; and Berselli, Orlando, 4,456,041, Cl. 141-329.000.

Berti, Jerome L.: *See*—
Penn, Steven M.; Berti, Jerome L.; and Kovarik, Robert F., Jr., 4,456,268, Cl. 277-106.000.

Bertin, Alain J. L.: *See*—
Ribassin, Patrick; Gallardo, Manuel; and Bertin, Alain J. L., 4,456,185, Cl. 241-92.000.

Best, Robert H., to Burlington Industries, Inc. Means for deterring misuse of copying machines. 4,456,373, Cl. 355-133.000.

Bete Fog Nozzle, Inc.: *See*—
Burnham, Richard C., 4,456,181, Cl. 239-403.000.

Beugelsdyk, Anthony F., to Conchemco, Incorporated. Bail attachment lawnmower zone start control. 4,455,811, Cl. 56-10.800.

Beyer, Karl, to La Nationale S.A. Hinge for spectacles. 4,456,346, Cl. 351-153.000.

Bichsel, Arthur W. Apparatus and method for simultaneously printing and embossing plastic and sealing and/or tear sealing the same. 4,455,933, Cl. 101-27.000.

Bieler, Barrie H.; Morgan, David C.; and Stringham, Robert R., to Dow Chemical Company, The. Photochemical reactor and method. 4,456,512, Cl. 204-162.00R.

Binstock, Morton H.; McCloskey, Thomas H.; and Podolsky, Leaman B., to Westinghouse Electric Corp. Turbine high pressure bypass temperature control system and method. 4,455,836, Cl. 60-663.000.

Biotech Research Laboratories, Inc.: *See*—
Granlund, David J., 4,455,842, Cl. 62-64.000.

Bishop, Gilbert H. Ice island structure and drilling method. 4,456,072, Cl. 166-362.000.

Bishop, Ross W.: *See*—
Baasch, Holger J.; Bishop, Ross W.; Charlson, Paul M.; Hunzeker, James G.; and Schwieters, Clarence R., 4,456,938, Cl. 360-109.000.

Bishop, Thomas R.; and Foreman, Arnal B., Jr., to Bowen Tools, Inc. Inner seal and support rod assembly for high pressure blowout preventers. 4,456,215, Cl. 251-1.00B.

Bishop-Wisecarver Corporation: *See*—
Joice-Cavanagh, Roland R., 4,456,415, Cl. 410-129.000.

Bisonaya, Rudy, to Elkay Manufacturing Company. Rotary coupling. 4,456,287, Cl. 285-281.000.

Bittler, Dieter: *See*—
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,456,600, Cl. 424-238.000.

Bixby, Guy T. Formable hose. 4,456,034, Cl. 138-122.000.

Bjorshol, Kolbjorn. System for handling of fishing gears. 4,455,778, Cl. 43-8.000.

Blackburn, Gary F., to Critikon, Inc. Support and anchoring mechanism for membranes in selectively responsive field effect devices. 4,456,522, Cl. 204-416.000.

Blackwell, Bernie; Netherwood, Shelley; and Piccolo, Dominick J., to Warner-Lambert Company. Process for flavoring chewing gum with stabilized peppermint oil. 4,456,621, Cl. 426-3.000.

Blanchot, Pierre, to Industeler. Silencer in stainless material for exhaust systems of automobile vehicles. 4,456,091, Cl. 181-282.000.

Blank, Heinz U.: *See*—
Marzolph, Gerhard; and Blank, Heinz U., 4,456,772, Cl. 568-424.000.

Blaskie, M. W.; Fox, J. R.; and Pesa, F. A., to Standard Oil Company. Catalysts for producing alcohols from olefins and synthesis gas. 4,456,694, Cl. 502-74.000.

Blechinger, Chester J.; and Focht, Louis R., to Ford Motor Company. Vortex shedding mass air flow sensor with stabilized fluid flow. 4,455,877, Cl. 73-861.220.

Bleicher, Manfred: *See*—
Schmid, Wolfgang; Wanner, Karl; Falchle, Jorg; Bleicher, Manfred; and Muller, Frank, 4,456,076, Cl. 173-116.000.

Bloomfield, Allen A.; and Wilson, Frank R., to Imperial Chemical Industries Limited. Apparatus for individual yarn selection particularly in donning multicop winders. 4,456,187, Cl. 242-18.0PW.

Bloy, Graham P., to Metme Communications. Signal transfer and system utilizing transmission lines. 4,457,014, Cl. 381-98.000.

Bludau, Wolfgang, to International Standard Electric Corporation. Optical coupling system and method for manufacturing same. 4,456,330, Cl. 350-96.180.

Blumenthal, Martin. Sorting top. 4,455,781, Cl. 446-241.000.

Bly, Kenneth B.; Ludecke, Otto A.; and Smith, Richard H., to General Motors Corporation. Diesel exhaust particulate trap with pleated filter. 4,455,823, Cl. 60-311.000.

Bochow, Richarda; Bergmann, Helmut; and Eikemeier, Siegfried, to Agfa-Gavaert Aktiengesellschaft. Tamperproof document and a process for producing the same. 4,456,667, Cl. 430-10.000.

Boehringer Mannheim GmbH: *See*—
Edelmann, Hermann; Pasch, Manfred; Klose, Sigmar; Haar, Hans-Peter; and Mann, Karlheinz, 4,456,581, Cl. 422-72.000.

Boeing Company, The: *See*—
Hapke, Donald W., 4,456,204, Cl. 244-53.00B.
McCrum, Russell C., 4,456,029, Cl. 137-498.000.
Pinson, George T., 4,455,943, Cl. 102-489.000.

Bogossian, Armen, to Flow Technology Corporation. Linear metering valve for tubes. 4,456,030, Cl. 137-614.110.

Bohm, Wolfgang: *See*—
Malikowski, Willi; Szulczyk, Andreas; Bohm, Wolfgang; and Wolmer, Roger, 4,456,662, Cl. 428-632.000.

Bolen, Charles E.: *See*—
Grossi, Anthony V.; Bolen, Charles E.; Hahn, Louis T.; and Marzocchi, Alfred, 4,456,633, Cl. 427-138.000.

Bollani, Umberto F., to Beloit Corporation. Method for adjusting the format of continuous aqueous fibre suspension delivered by the head boxes of a paper manufacturing machine, and the device for carrying out said method. 4,456,502, Cl. 162-133.000.

Bom, Cornelis J. G.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,456,039, Cl. 141-98.000.

Bommaraju, Tilak V., to Occidental Chemical Corporation. Noble metal-coated cathode. 4,456,518, Cl. 204-290.00F.

Bonse, Gerhard; and Schmidt, Thomas, to Bayer Aktiengesellschaft. Preparation of hydrazidines. 4,456,769, Cl. 564-226.000.

Boon, Bart, to Gusto Engineering B.V. Method for increasing the stability of an artificial island by means of pre-loading. 4,456,402, Cl. 405-196.000.

Boon, Bart, to RSV-Gusto Engineering B.V. Device for absorbing horizontally directed impacts on the support legs of an artificial island during lowering and lifting of the legs respectively. 4,456,403, Cl. 405-196.000.

Boor nee Mezei, Anna: *See*—
Toth, Jozsef; Hajos, Gyorgy; Fekete, Gyorgy; Horvath, Istvan; Szporny, Laszlo ; Boor nee Mezei, Anna; Aranyi, Peter; Naray, Aniko; Gorog, Sandor; Holly, Sandor; and Molnar, Csaba, 4,456,601, Cl. 424-241.000.

Bordignon, Abramo, to A.T.B. S.p.A. Fresnel lens, and a method and mold for manufacturing it. 4,456,344, Cl. 350-452.000.

Borg-Warner Chemicals, Inc.: *See*—
Halpern, Yuval, 4,456,721, Cl. 524-288.000.

Borg-Warner Corporation: *See*—
Hechenbleikner, Ingenuin; and Enlow, William P., 4,456,567, Cl. 260-985.000.

Bortolin, Peter. Bicycle assembly. 4,456,276, Cl. 280-257.000.

Boruta, Thaddeus, to Ford Motor Company. Carburetor fuel bowl vent valve assembly. 4,456,216, Cl. 251-11.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Stehr, Thomas; Brodzina, Lieselotte; and Graf, Richard, 4,455,701, Cl. 8-158.000.

Bose Corporation: *See*—
Froeschle, Thomas A., 4,456,872, Cl. 323-286.000.

Botden, Peter J. M., to U.S. Philips Corporation. Device for determining local absorption differences in an object. 4,457,009, Cl. 378-19.000.

Bottger, Ernst: *See*—
Suttinger, Richard; Bottger, Ernst; Henrich, Hans O.; Bahr, Theodor; and Thumm, Helmut, 4,456,182, Cl. 241-46.020.

Bottomley, Eric; and Foster, Malcolm C., to Fletcher Sutcliffe Wild Limited. Transmission coupling including a clutch-brake combination. 4,456,109, Cl. 192-18.00A.

Botzem, Werner; Laug, Reiner; Kroll, Hartmut; Schlich, Elmar; Anspach, Walter; Brendel, Karl; and Srostlik, Peter, to Transnuklear GmbH. Transportation and/or storage containers for radioactive material. 4,456,827, Cl. 250-506.100.

Bouchaudon, Jean: *See*—
Aloup, Jean-Claude; Bouchaudon, Jean; Farge, Daniel; and James, Claude, 4,456,758, Cl. 546-284.000.

Bournonville, Jean-Paul: *See*—
Travers, Christine; Trinh Dinh, Chan; Snappe, Roger; and Bournonville, Jean-Paul, 4,456,775, Cl. 568-885.000.

Bourque, Joseph A.: *See*—
Wedman, Leonard N.; and Bourque, Joseph A., 4,456,934, Cl. 360-78.000.

Bowen Tools, Inc.: *See*—
Bishop, Thomas R.; and Foreman, Arnal B., Jr., 4,456,215, Cl. 251-1.00B.

Boyer, Wayne E. Goggle with tear off transparencies. 4,455,689, Cl. 2-434.000.

Boyles, Robert L., to General Electric Company. Weighing scale. 4,456,085, Cl. 177-256.000.

Brackmann, Warren A.; and Snaidr, Stanislav M., to Rothmans of Pall Mall Canada Limited. Feeding tobacco cutting machines. 4,456,018, Cl. 131-116.000.

Brand, Mordechai: *See*—
Peled, Emanuel; Meitav, Azieh; and Brand, Mordechai, 4,456,665, Cl. 429-105.000.

Brander, Hans I. Combi-equipment. 4,456,094, Cl. 182-20.000.

Braunhut, Harold N. Spring whip defensive weapon. 4,456,255, Cl. 273-84.00R.

Breining, Tibor: *See*—
Hermecz, Istvan; Breining, Tibor; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Kokosi, Jozsef, 4,456,752, Cl. 544-116.000.

Breitenfellner, Franz; and Kainmuller, Thomas, to Ciba-Geigy Corporation. Thermoplastic moulding composition and the use thereof. 4,456,723, Cl. 524-415.000.

Brelsford, John E.; and Glass, Emmett F., to Sperry Corporation. Unloading auger control system. 4,455,922, Cl. 91-358.00A.

Brendel, Karl: *See*—
Botzem, Werner; Laug, Reiner; Kroll, Hartmut; Schlich, Elmar; Anspach, Walter; Brendel, Karl; and Srostlik, Peter, 4,456,827, Cl. 250-506.100.

Brennan, John J.: *See*—
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Brennstoffinstitut Freiberg: *See*—
Kretschmer, Horst; Fleischer, Klaus; Gohler, Peter; Schingnitz, Manfred; Berger, Friedrich; Jegorow, Aleksander; Fedotov, Vasilij; Gavrilin, Vladimir; Gudymov, Ernest; Semenov, Vladimir; Achmatov, Igol; Majdurov, Nikolaj; and Avraamov, Evgenij, 4,455,949, Cl. 110-263.000.

Breuer, Oswald: *See*—
Merten, Gerhard; Breuer, Oswald; Hesse, Norbert; and Steinkuhl, Bernd, 4,456,307, Cl. 299-93.000.

Brickey, Russell A.: *See*—
Salter, Lowell S., Jr.; Divirgilio, Ralph F.; and Brickey, Russell A., 4,455,856, Cl. 72-236.000.

Bringol, Charles R.; and Kroeger, Wilbert L., III, to International Business Machines Corporation. Memory system with flexible replacement units. 4,456,966, Cl. 364-900.000.

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Opel, Paul; Herbst, Klaus; Brinkmann, Heinz; Luders, Albrecht; and Wolsdorf, Hans P., 4,456,308, Cl. 301-9.0DN.

Brisson, Alfred S.: *See*—
Nowacki, Christopher; and Brisson, Alfred S., 4,456,016, Cl. 128-725.000.

Brissonneau et Lotz Marine: *See*—
Havard, Jean F., 4,456,224, Cl. 254-89.00R.

Bristol-Myers Company: *See*—
Schmitz, Henry; Kaneko, Takushi; Essery, John M.; and Doyle, Terrence W., 4,456,765, Cl. 549-332.000.

Brite-Vue Glass Systems, Inc.: *See*—
Gross, Robert A.; and Guardia, James F., 4,456,290, Cl. 292-337.000.

British Castors Limited: *See*—
Screen, Stafford T., 4,455,707, Cl. 16-35.00R.

British Petroleum Company Limited, The: *See*—
Barker, Derek, 4,455,969, Cl. 122-4.00D.

Brodzina, Lieselotte: *See*—
Stehr, Thomas; Brodzina, Lieselotte; and Graf, Richard, 4,455,701, Cl. 8-158.000.
Brogie, Earl W. Door prop. 4,456,291, Cl. 292-338.000.
Broken Hill Proprietary Company Limited, The: *See*—
Smith, Barry W.; and Hudson, Anthony J., 4,455,733, Cl. 29-421.00R.
Bromikowski, Raymond J., to RTE Corporation. Gapless elbow arrester. 4,456,942, Cl. 361-127.000.
Brother Kogyo Kabushiki Kaisha: *See*—
Yamamoto, Yoshikazu; Sano, Kohzoh; Haneda, Kunio; and Yanagi, Toshiaki, 4,455,956, Cl. 112-274.000.
Broussard, Paul P.; Paul, Donald; and Granger, Donald W. Method for determining borehole or cavity configuration through inert gas interface. 4,455,869, Cl. 73-151.000.
Brower, Boyd G., to GTE Products Corporation. Subminiature array with flexible reflector. 4,456,946, Cl. 362-15.000.
Brown Fintube Company: *See*—
Powell, John R., 4,456,058, Cl. 165-154.000.
Brown, Hugh B., to Ampex Corporation. Hybrid spectrum analyzer system. 4,456,877, Cl. 324-77.00K.
Brown, Maurice L., to Brown, Maurice Lechmere; Batchelar, Ian Howard; Ogilvey, Graham Arthur; and Noonan, John Gerrad. Carburettors for internal combustion engines. 4,455,979, Cl. 123-407.000.
Brown, Maurice Lechmere: *See*—
Brown, Maurice L., 4,455,979, Cl. 123-407.000.
Brown, Royden. Pollen trap for double queen colony with queen excluder. 4,455,699, Cl. 6-4.00R.
Brown University Research Foundation: *See*—
De Rossi, Danilo E.; Galletti, Pierre M.; and Dario, Paolo, 4,456,013, Cl. 128-675.000.
Brownscombe, Thomas F., to Shell Oil Company. Rapid curing epoxy compositions. 4,456,698, Cl. 502-203.000.
Bruggemann, Werner; and Laus, Heinrich, to Girmes-Werke AG. Method of making double-sided textile material and textile material produced thereby. 4,456,035, Cl. 139-398.000.
Bruker Analytische Messtechnik GmbH: *See*—
Schneider, Lutz; and Guigas, Bruno, 4,456,933, Cl. 360-49.000.
Bruls, Pierre G. M. B.: *See*—
Zuidam, Jan; van Nassau, Petrus J. M.; Bruls, Pierre G. M. B.; and Jonckers, Kees, 4,456,535, Cl. 210-750.000.
Brun, Norbert, to Cibie Projecteurs. Motor vehicle headlamp with a narrow outlet window. 4,456,948, Cl. 362-268.000.
Brundige, Virgil L., Jr., to Mobil Oil Corporation. Arrangement and method for the production of liquid natural gas. 4,456,459, Cl. 62-9.000.
Bryant, Deolan R. Two piece ball valve assembly. 4,456,221, Cl. 251-152.000.
Buck, Keith E.; Chase, Irving C.; and Morin, Marius J., to Thoratec Laboratories Corporation. Flow restrictor. 4,456,014, Cl. 128-719.000.
Buckeye Cellulose Corporation, The: *See*—
Owens, James W., 4,456,543, Cl. 252-106.000.
Buckley, Leo P., Jr.; Chausse, Burnette P.; Chen, Arthur C.; Russell, John N.; and Wong, Thomas Y., to General Electric Company. Control system and method for controlling a gas turbine in accordance with the temperature conditions thereof. 4,455,820, Cl. 60-39.030.
Budapesti Radiotechnikai Gyar: *See*—
Janosi, Marcell, 4,456,935, Cl. 360-97.000.
Budd Company, The: *See*—
Pavlick, Michael J., 4,456,413, Cl. 410-56.000.
Buddendeck, Mark H., to Xerox Corporation. Plural mode recirculating document handler. 4,456,236, Cl. 271-3.100.
Buddendeck, Mark H., to Xerox Corporation. Plural mode recirculating document handler. 4,456,237, Cl. 271-3.100.
Buhner, Ernst; Zink, Ottmar; and Hahn, Gunter, to Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co. Pig-charging apparatus for a hot-chamber pressure-diecasting machine. 4,456,229, Cl. 266-95.000.
Buisson, Mark F. B.: *See*—
Bayle-Laboure, Gerard J. P.; Buisson, Mark F. B.; Linstrumelle, Roger B.; and Pachot, Jean-Claude, 4,455,822, Cl. 60-39.822.
Bullions, Robert J., III; Curlee, Thomas O., III; Gum, Peter H.; McGilvray, Bruce L.; and Richardson, Ethel L., to International Business Machines Corporation. Virtual machine system with guest architecture emulation using hardware TLB's for plural level address translations. 4,456,954, Cl. 364-200.000.
Bullis, Robert H.; Kimberley, John A.; and Couch, Robert P., to Ambac Industries, Incorporated. Method and apparatus for indicating an operating characteristic of an internal combustion engine. 4,456,883, Cl. 324-464.000.
Bunner, Charles B. D.: *See*—
Carsten, Ralph T.; Nakhla, Michael S.; and Bunner, Charles B. D., 4,456,985, Cl. 370-30.000.
Carsten, Ralph T.; Nakhla, Michael S.; and Bunner, Charles B. D., 4,456,986, Cl. 370-30.000.
Bunting, John G.: *See*—
Groves, Ian S.; Guard, David R.; Bunting, John G.; Rowlands, Christopher E.; Powter, Edwin J.; Holmes, David W. J.; and Trott, Graham J., 4,456,789, Cl. 179-18.0BC.
Bupara, Sargit S.: *See*—
Shapiro, Wilbur; and Bupara, Sargit S., 4,455,974, Cl. 123-47.00R.
Burg, Karlheinz: *See*—
Luders, Walter; and Burg, Karlheinz, 4,456,710, Cl. 523-200.000.
Burgdorfer, Hans-Heribert; Schapel, Dietmar; Schneider, Gottfried; von Bonin, Wulf; and von Gizycki, Ulrich, to Bayer Aktiengesellschaft. Gel pads and a process for their preparation. 4,456,642, Cl. 428-68.000.
Burke, Timothy M.; and Noble, Scott W., to Motorola, Inc. Digital coherent PSK demodulator and detector. 4,457,005, Cl. 375-82.000.
Burling, Berkley S., to Acmil Plastic Products Pty. Ltd. Container. 4,456,142, Cl. 220-4.00F.
Burlington Industries, Inc.: *See*—
Baber, R. Richard, 4,456,129, Cl. 211-13.000.
Best, Robert H., 4,456,373, Cl. 355-133.000.
Burmeister, Werner, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Cutting tool. 4,456,409, Cl. 407-104.000.
Burnham, Richard C., to Bete Fog Nozzle, Inc. Gas liquid mixing nozzle. 4,456,181, Cl. 239-403.000.
Burrill, Charles E., Jr.; Smirlock, Martin E.; and Krepchin, Ira P., to Foster-Miller Associates, Inc. Process and apparatus for thermal enhancement. 4,456,068, Cl. 166-303.000.
Burroughs Corporation: *See*—
Catiller, Robert D.; and Forbes, Brian K., 4,456,970, Cl. 364-900.000.
DeSantis, Alfred J.; and Schibinger, Joseph S., 4,456,958, Cl. 364-200.000.
Kocot, Raymond H., 4,456,916, Cl. 346-140.00R.
Burton, George W.: *See*—
Davis, Eugene E.; and Burton, George W., 4,456,143, Cl. 220-214.000.
Busch, Douglas I. Film holder apparatus for field and studio cameras. 4,456,358, Cl. 354-285.000.
Bush, Michael E.: *See*—
Torday, John; and Bush, Michael E., 4,456,508, Cl. 204-27.000.
Buss, Waldeen C.; Field, Leslie A.; and Robinson, Richard C., to Chevron Research Company. Hydrocarbon conversion process. 4,456,527, Cl. 208-89.000.
Buter, Hermann, to Daimler-Benz Aktiengesellschaft. Thermostatically controlled valve in the circulation of liquid cooled internal combustion engines. 4,456,167, Cl. 236-345.000.
Bystedt, Hjalmar S. I., to Sunds Defibrator AB. Apparatus for manfacturing mechanical pulp. 4,456,503, Cl. 162-261.000.
C. Conradty Nurnberg GmbH & Co.: *See*—
Zollner, Dieter; Zollner, Christine; Lauterbach-Dammler, Inge; Koziol, Konrad; and Pilbrow, Malcolm F., 4,456,519, Cl. 204-290.00R.
C. Van der Lely N.V.: *See*—
van der Lely, Ary; and Bom, Cornelis J. G., 4,456,039, Cl. 141-98.000.
Cable, Harold E.; and Rodrigues, Anil N., to Weld Tooling Corporation. Radius attachment for automated welding and cutting torch carriages. 4,456,228, Cl. 266-70.000.
Cadars, Patrick, to Valeo. Heat exchanger having a bundle of parallel tubes, and method of assembling its component parts. 4,456,059, Cl. 165-173.000.
Cais, Michael; and Shimoni, Moshe, to Technion Research and Development Foundation, Ltd. Non-centrifugation method for immunoassay of materials. 4,456,690, Cl. 436-500.000.
Calabrese, John. Stretching apparatus. 4,456,249, Cl. 272-139.000.
Calizano, Fernand; and Chauvel, Michel, to Compagnie Internationale pour l'Informatique CII Honeywell Bull (Societe Anonyme). Device for selectively securing an object to a shaft. 4,456,209, Cl. 242-68.100.
Callanan, Dennis T.; Lawson, Gerald P.; and Reardon, Francis J., to Winona Tool Manufacturing Company. Brake lathe. 4,455,900, Cl. 82-4.00A.
Callies, David G. Caliber-reducing kit for a revolver. 4,455,777, Cl. 42-59.000.
Calor Agriculture Research, Inc.: *See*—
Dika, John A.; and Juengst, Fredrick W., Jr., 4,456,623, Cl. 426-69.000.
Campbell Soup Company: *See*—
Lasky, Robert; Lobach, Donald C.; and Bauer, Edward J., 4,456,804, Cl. 219-10.430.
Canada-Cities Service, Ltd.: *See*—
Lorenz, Gordon; and Gehring, Ken, 4,456,536, Cl. 210-776.000.
Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence: *See*—
Steffler, Jean C.; Kaufman, Herman; Porlier, Joseph A. G.; and Firth, James A., 4,455,685, Cl. 2-2.10A.
Canadian Patents & Development Limited: *See*—
Merritt, W. R., 4,455,801, Cl. 52-309.900.
Canetta, Thomas J. Yarn feeder. 4,456,197, Cl. 242-130.400.
Cann, George W.; Davis, Donald E.; and Trotter, Ralph R., to International Business Machines Corporation. X-Y Positioning subsystem electronics. 4,456,860, Cl. 318-561.000.
Canon Kabushiki Kaisha: *See*—
Fujibayashi, Kazuo, 4,456,345, Cl. 350-469.000.
Hiramatsu, Akira; and Yamamichi, Masayoshi, 4,456,351, Cl. 354-402.000.
Hirata, Noritsugu; Okajima, Hidekazu; Takigawa, Tomoshi; Ichiyanagi, Toshikazu; and Takimoto, Hiroyuki, 4,456,349, Cl. 352-91.00C.
Ikemori, Keiji, 4,456,340, Cl. 350-422.000.
Isaka, Kazuo; Hosono, Nagao; and Takahashi, Tohru, 4,456,368, Cl. 355-3.0FU.
Kato, Masatake, 4,456,341, Cl. 350-427.000.
Komiya, Yutaka; Murakami, Katsumi; Inuzuka, Tsuneki; and Sakamaki, Hisashi, 4,456,366, Cl. 355-8.000.
Kuge, Tsukasa; Tanigawa, Koichi; and Watanabe, Tsuyoshi, 4,456,825, Cl. 250-324.000.

Mabuchi, Minoru; Fujimura, Naoto; Ishikawa, Shozo; Takasu, Yoshio; Sakai, Kiyoshi; and Kuribayashi, Masaki, 4,456,671, Cl. 430-58.000.
Masaki, Nobuo; Tokuda, Hiroyuki; Furukawa, Yoshiki; Sakurai, Mitsuru; and Nitanda, Hiroshi, 4,456,362, Cl. 355-3.00R.
Murata, Minoru; and Kawanabe, Tsuyoshi, 4,455,937, Cl. 101-93.150.
Nozaki, Mineo; Asakura, Osamu; Nagashima, Masasumi; and Iwakura, Sadao, 4,456,392, Cl. 400-120.000.
Sato, Yasuhisa, 4,456,352, Cl. 354-429.000.
Sato, Yukio, 4,456,369, Cl. 355-14.0SH.
Sunouchi, Akio; Fujino, Masahisa; and Suzuki, Ryuji, 4,456,357, Cl. 354-266.000.
Tamura, Shuichi, 4,456,360, Cl. 354-195.100.

Canzek, Ludvik. High speed catadioptric objective lens system. 4,456,343, Cl. 350-444.000.

Caporossi, Adolfo; and Del Signore, Leonello, to Anic S.p.A. Composition for lining the walls of reactors and connected apparatus used for polymerizing vinyl compounds which prevents or reduces deposits and incrustations on said apparatus, and the method for its use. 4,456,731, Cl. 525-61.000.

Carickhoff, Richard C., to Computer Peripherals Inc. Data tracking clock recovery system using digitally controlled oscillator. 4,456,890, Cl. 331-1.00A.

Carl Zeiss-Stiftung: *See*—
Schulz, Kurt; and Maglica, Peter, 4,456,348, Cl. 351-212.000.

Carlgren, Richard G.; Rosenbaum, Walter S.; and Tannenbaum, Alan R., to International Business Machines Corporation. Automatic text grade level analyzer for a text processing system. 4,456,973, Cl. 364-900.000.

Carlos, Donald D.; Gannon, Charles R.; and Wombles, Robert H., to Ashland Oil, Inc. Processes for producing high grade asphaltic materials from low grade bituminous materials and products resulting therefrom. 4,456,523, Cl. 208-5.000.

Carlos, Donald D.: *See*—
Wombles, Robert H.; Gannon, Charles R.; and Carlos, Donald D., 4,456,524, Cl. 208-5.000.

Carossino, Andre . Hand tool for removing material from a part, especially deburring or breaking angles. 4,455,747, Cl. 30-171.000.

Carpenter, Alan E., to Cyclodynamics of Colorado, Inc. Tricycle. 4,456,277, Cl. 280-282.000.

Carpenter, Jean-Francois: *See*—
Henry, Raymond; Simon, Jacques; Levy, Daniele; Carpenter, Jean-Francois; and Defaut, Bernard, 4,456,334, Cl. 350-320.000.

Carrier Corporation: *See*—
Fraser, Howard H., Jr.; and Jacobs, John J., 4,456,941, Cl. 361-105.000.

Carrington, Wilbur A.; Fredricks, Ronald J.; Gubbins, Harry L.; Eckley, Gordon P.; Perfitt, Thomas E.; and Page, Jerry L., to Lear Siegler, Inc. Optical rate sensor. 4,456,376, Cl. 356-350.000.

Carsten, Ralph T.; Nakhla, Michael S.; and Bunner, Charles B. D., to Northern Telecom Limited. Apparatus for coupling signals to or from a two-wire line. 4,456,985, Cl. 370-30.000.

Carsten, Ralph T.; Nakhla, Michael S.; and Bunner, Charles B. D., to Northern Telecom Limited. Apparatus for coupling signals to or from a two-wire line. 4,456,986, Cl. 370-30.000.

Carter, F. Anthony; and Sacks, Jacob M., to Hughes Aircraft Company. Real-time ordinal-value filter utilizing half-interval ranking. 4,456,968, Cl. 364-900.000.

Carter, Frank E.: *See*—
Rogers, Alfred M., III; and Carter, Frank E., 4,456,312, Cl. 308-6.00C.

Carver, Robert W. FM Stereo apparatus and method. 4,457,012, Cl. 381-3.000.

Casati, Francois M.: *See*—
Arbir, Francis W.; Raden, Daniel S.; Narducy, Kenneth W.; and Casati, Francois M., 4,456,696, Cl. 502-167.000.

Cassat, Robert; and Vignando, Bruno, to Rhone-Poulenc Industries. Metal-clad laminate adapted for printed circuits. 4,456,657, Cl. 428-415.000.

Castellino, Paolo; and Rusina, Fulvio, to Cselt Centro Studi e Laboratori Telecomunicazioni S.p.A. Digital speech/data discriminator for transcoding unit. 4,457,013, Cl. 381-46.000.

Catalanotti, Paul R.: *See*—
Ruck, Wilf; Russell, Brian; Roehr, George L.; and Catalanotti, Paul R., 4,456,214, Cl. 249-144.000.

Catiller, Robert D.; and Forbes, Brian K., to Burroughs Corporation. Interrupt system for peripheral controller. 4,456,970, Cl. 364-900.000.

Cedars Sinai Medical Center: *See*—
Rubinstein, Alan, 4,456,590, Cl. 424-101.000.

Ceintrey, Marcel. Mechanical anchorage in resinous composition for sealing strip. 4,456,398, Cl. 404-69.000.

Central Mine Equipment Company: *See*—
Rassieur, Charles L., 4,456,079, Cl. 175-58.000.

Centre de Recherches de Pont A Mousson: *See*—
Freis, Jean L.; Hauer, Jean C.; and Oger, Jacques, 4,456,397, Cl. 404-25.000.

Centro Corporation: *See*—
Benjamin, Harry L., 4,455,754, Cl. 33-174.00L.

Cerankowski, Leon D.; LaPointe, Gary S.; and Mattucci, Neil C., to Polaroid Corporation. Color transfer photographic processes and products. 4,456,674, Cl. 430-221.000.

Cerny, Walter: *See*—
Lang, Armin; and Cerny, Walter, 4,456,087, Cl. 180-142.000.

Cerundolo, Daniel G.: *See*—
Reimels, Harry G.; Cerundolo, Daniel G.; and Downing, Roy W., 4,456,010, Cl. 128-310.000.

Champion International Corporation: *See*—
Kuehn, Scott L., 4,456,131, Cl. 212-97.000.

Chan, Rebecca L. S.: *See*—
Dawson, Marcia I.; and Chan, Rebecca L. S., 4,456,618, Cl. 424-308.000.

Chao, Chien C.: *See*—
Sherman, John D.; and Chao, Chien C., 4,456,774, Cl. 568-872.000.

Chap, John P., to Selfix, Inc. Hangable, stackable basket. 4,456,125, Cl. 206-513.000.

Chapman, T. Walton. Trailer towing device. 4,456,278, Cl. 280-402.000.

Charlson, Paul M.: *See*—
Baasch, Holger J.; Bishop, Ross W.; Charlson, Paul M.; Hunzeker, James G.; and Schwieters, Clarence R., 4,456,938, Cl. 360-109.000.

Charniga, Joseph. Wire screen fire stops. 4,455,802, Cl. 52-317.000.

Chase, Irving C.: *See*—
Buck, Keith E.; Chase, Irving C.; and Morin, Marius J., 4,456,014, Cl. 128-719.000.

Chausse, Burnette P.: *See*—
Buckley, Leo P., Jr.; Chausse, Burnette P.; Chen, Arthur C.; Russell, John N.; and Wong, Thomas Y., 4,455,820, Cl. 60-39.030.

Chauvel, Michel: *See*—
Calizano, Fernand; and Chauvel, Michel, 4,456,209, Cl. 242-68.100.

Chea, Ramon C. W., Jr.; Das, Santanu; Upp, Daniel C.; Cornu, Jozef; Danneels, Johan M. R.; and Taeymans, Jean R. J. M., to International Telephone and Telegraph Corporation. Telephone line circuit and system. 4,456,991, Cl. 370-58.000.

Chemet Corporation: *See*—
Jost, Ernest M., 4,456,473, Cl. 75-0.50A.
Jost, Ernest M., 4,456,474, Cl. 75-0.50A.

Chemische Werke Huels Aktiengesellschaft: *See*—
Zolffel, Michael; and Gaube, Johann, 4,456,778, Cl. 570-255.000.

Chen, Arthur C.: *See*—
Buckley, Leo P., Jr.; Chausse, Burnette P.; Chen, Arthur C.; Russell, John N.; and Wong, Thomas Y., 4,455,820, Cl. 60-39.030.

Chen, Hong C., to Chevron Research Company. Hydroprocessing catalyst having bimodal pore distribution and process for preparing the catalyst. 4,456,701, Cl. 502-221.000.

Chenier, Andre, to Hydro-Quebec. Demagnetization circuit for current transformers. 4,456,875, Cl. 324-55.000.

Chevron Research Company: *See*—
Buss, Waldeen C.; Field, Leslie A.; and Robinson, Richard C., 4,456,527, Cl. 208-89.000.
Chen, Hong C., 4,456,701, Cl. 502-221.000.
Freenor, Francis J., III, 4,456,467, Cl. 71-88.000.
Kobzina, John W., 4,456,471, Cl. 71-118.000.
Spars, Byron G.; Tamm, Paul W.; and Wallman, P. Henrik, 4,456,504, Cl. 201-12.000.
Spars, Byron G.; Klett, Robert J.; and Wallman, P. Henrik, 4,456,525, Cl. 208-11.00R.

Chi, Chang V., to Energy Research Corporation. Method of making an integral carbonized cooler assembly. 4,456,645, Cl. 428-166.000.

Chia, E. Henry: *See*—
Adams, Ronald D.; and Chia, E. Henry, 4,456,491, Cl. 148-2.000.

Chiang, David: *See*—
Chu, Mosi; Chiang, David; and Manber, Solomon, 4,456,240, Cl. 271-4.000.

Childs, Willard D. Regulator for high volume air flow control. 4,456,025, Cl. 137-115.000.

Chin, Te N., to United States of America, Army. Composite resist structures for submicron processing in electron/ion lithography. 4,456,677, Cl. 430-276.000.

Chinoin Gyogyszer es Vegyeszeti Termekek Gyara R.T.: *See*—
Hermecz, Istvan; Breining, Tibor; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Kokosi, Jozsef, 4,456,752, Cl. 544-116.000.

Chinone, Koichi: *See*—
Sugimoto, Yasuo; Maeda, Masami; Ishimura, Hiroshi; Saito, Satoshi; and Chinone, Koichi, 4,455,818, Cl. 57-293.000.

Chisso Engineering Co. Ltd.: *See*—
Ando, Masao, 4,456,186, Cl. 219-300.000.

Christ, Alfred, to Escher Wyss GmbH. Fiberizer for stock suspensions for fabricating paper. 4,456,183, Cl. 241-46.170.

Christensen, Robert F., to McFarland, Clyde M.; Janssen, Joyce J.; and Gibson, Shirley I. Beverage can opener tool. 4,455,895, Cl. 81-3.46R.

Christie, Frederick R.; and Daley, Lawrence R., to International Business Machines Corporation. Bismaleimide triazine composition. 4,456,712, Cl. 523-439.000.

Christmann, Wolfgang; Lindner, Gerhard; and Lingens, Paul, to Dynamit Nobel Aktiengesellschaft. Process for the production of compacted explosive devices for ammunition or explosive charges, especially those of a large caliber. 4,455,914, Cl. 86-1.00R.

Chu, Mosi; Chiang, David; and Manber, Solomon, to MCC Associates. Paper supply and stacking apparatus. 4,456,240, Cl. 271-4.000.

Chung, Chi H.; Lu, Sun; and Chung, David B., to Minnesota Mining and Manufacturing Company. High brightness internal reflector for liquid crystal displays and its method of fabrication. 4,456,336, Cl. 350-338.000.

Chung, David B.: *See*—
Chung, Chi H.; Lu, Sun; and Chung, David B., 4,456,336, Cl. 350-338.000.

Churchland, Mark T., to MacMillan Bloedel Limited. Microwave applicator for continuous press. 4,456,498, Cl. 156-275.500.

Ciba Geigy AG: *See—*
Lenoir, John; and Jan, Gerald, 4,456,668, Cl. 430-17.000.
Turner, George F. A. M., 4,456,359, Cl. 354-312.000.
Ciba-Geigy Corporation: *See—*
Breitenfellner, Franz; and Kainmuller, Thomas, 4,456,723, Cl. 524-415.000.
Drabek, Jozef, 4,456,559, Cl. 260-429.700.
Holzle, Gerd; Reinert, Gerhard; and Polony, Rudolf, 4,456,452, Cl. 8-103.000.
Martin, Henry, 4,456,468, Cl. 71-88.000.
Regenass, Willy; Giger, Gerhard; Kuster, Kaspar; and Achermann, Heinz, 4,456,389, Cl. 374-31.000.
Ruegg, Christoph; and Voirol, Peter, 4,456,653, Cl. 428-379.000.
Spivack, John D.; and Pastor, Stephen D., 4,456,716, Cl. 524-104.000.
Cibie Projecteurs: *See—*
Brun, Norbert, 4,456,948, Cl. 362-268.000.
Cincinnati Milacron Inc.: *See—*
Smith, Roger D., 4,456,447, Cl. 425-182.000.
Cinkowski, James M., to Du Pont de Nemours, E. I., and Company. Amine stabilizers for wash-off systems. 4,456,676, Cl. 430-264.000.
Citizen Watch Company Limited: *See—*
Matsumoto, Masataka, 4,456,388, Cl. 368-294.000.
Clarion Company, Ltd.: *See—*
Minagawa, Shoichi; Okamoto, Takeshi; and Niitsuma, Teruo, 4,456,847, Cl. 310-313.00R.
Sato, Yasuo; and Sakai, Takamasa, 4,456,917, Cl. 357-14.000.
Clark, Charles E.: *See—*
Markley, Theodore J.; Galdun, Daniel J.; Clark, Charles E.; Henderson, Robert G.; and Jencen, Frank W., 4,456,315, Cl. 312-137.000.
Clark, Donald L.; and Legler, John G., to Shopsmith, Inc. Planer table assembly. 4,456,042, Cl. 144-129.000.
Clark, Reginald H.; and Nodelman, Joel R., to Queen's University at Kingston. Aerosol exposure monitoring device. 4,455,881, Cl. 73-863.210.
Clarke, Wayne C., to Manville Service Corporation. Low-cost, highly filled, wax-based hot melt adhesives and coatings. 4,456,649, Cl. 428-285.000.
Clarks of England, Inc.: *See—*
Bergmans, Charles, 4,455,767, Cl. 36-83.000.
Clawson, Burrell E.; and Weigl, James. Respiratory apparatus and method. 4,456,008, Cl. 128-205.190.
Clement, Burke. Twist drill. 4,456,411, Cl. 408-223.000.
Cleveland Machine Controls, Inc.: *See—*
Matusek, Robert D., 4,456,863, Cl. 318-572.000.
Clifford, Graham F.; and Spurrier, Mack W., to Gaston County Dyeing Machine Company. Apparatus and method for processing raw fiber stock. 4,455,931, Cl. 100-37.000.
Clones, Michael E. Starter wedge for splitting wood. 4,456,044, Cl. 144-193.00D.
Clothier, Donald R.: *See—*
Lee, E. Paul; McCormick, Frederick H.; Vietmeier, Dennis P.; Harrington, Neal C.; and Clothier, Donald R., 4,456,972, Cl. 364-900.000.
Coachmen Industries, Inc.: *See—*
Snyder, Steven A.; and Reeve, Gary L., 4,456,275, Cl. 280-163.000.
Coates, Clarence A., Jr.: *See—*
Weaver, Max A.; and Coates, Clarence A., Jr., 4,456,551, Cl. 260-158.000.
Codega, Louis S.: *See—*
Kushner, James; Constantine, Walter F.; Radadia, Dhiru; and Codega, Louis S., 4,456,785, Cl. 174-105.0SC.
Codman & Shurtleff, Inc.: *See—*
Reimels, Harry G.; Cerundolo, Daniel G.; and Downing, Roy W., 4,456,010, Cl. 128-310.000.
Coetsier, Paul A., to Etablissements M. Muller et Cie. Apparatus for measuring the alignment of the front and rear wheel systems of automotive vehicles as well as the setback angles between the wheels of the front system and the side-slip angle. 4,455,759, Cl. 33-288.000.
Cohen, Violette; and Levieux, Philippe L. P., to Compagnie Internationale pour l'Informatique CII Honeywell Bull (Societe Anonyme). Apparatus for and method of addressing data elements in a table having several entries. 4,456,953, Cl. 364-200.000.
Cole, Robert F. Post anchoring device. 4,455,795, Cl. 52-155.000.
Colgate-Palmolive Company: *See—*
Hayes, Harry; and Harvey, Kenneth, 4,456,585, Cl. 424-49.000.
Colglazier, Donald F.; and Kollar, Ernest P., to International Business Machines Corporation. Bottom-up stacker. 4,456,235, Cl. 271-3.100.
Collins, Michael L.: *See—*
Nelson, Kenneth W.; Woo, Ricky A.; Palumbo, Patrick D.; and Collins, Michael L., 4,456,626, Cl. 426-553.000.
Colombo, Edward A., to Mobil Oil Corporation. Coextruded two-ply laminate films of low density polyethylene and blend of polybutene-1 and polyethylene or polypropylene. 4,456,660, Cl. 428-516.000.
Colombo, Roberto: *See—*
Ragazzini, Franco; and Colombo, Roberto, 4,456,573, Cl. 264-53.000.
Colyer, Timothy D., to Armstrong World Industries, Inc. Decorative laminate. 4,456,643, Cl. 428-156.000.
Combi Co., Ltd.: *See—*
Nakao, Shinroku; Ishii, Yoshiyasu; and Nagata, Kazuo, 4,456,007, Cl. 128-200.210.
Combs, Richard B.: *See—*
Davenport, Clair H.; Combs, Richard B.; and Wilber, Dennis A., 4,455,865, Cl. 73-116.000.
Commonwealth of Australia, The Department of Health: *See—*
Kossoff, George; and Jellins, Jack, 4,455,872, Cl. 73-618.000.
Compagnie Internationale pour l'Informatique CII Honeywell Bull (Societe Anonyme): *See—*
Calizano, Fernand; and Chauvel, Michel, 4,456,209, Cl. 242-68.100.
Cohen, Violette; and Levieux, Philippe L. P., 4,456,953, Cl. 364-200.000.
Compton, Richard A.: *See—*
Van Aken Redinger, Peter; and Compton, Richard A., 4,455,691, Cl. 3-36.000.
Compton, Russell A., to Technicare Corporation. Gradient-coil apparatus for a magnetic resonance system. 4,456,881, Cl. 324-319.000.
Computer Peripherals Inc.: *See—*
Carickhoff, Richard C., 4,456,890, Cl. 331-1.00A.
Concast Holding AG: *See—*
Kawakami, Takashi, 4,456,052, Cl. 164-416.000.
Conchemco, Incorporated: *See—*
Beugelsdyk, Anthony P., 4,455,811, Cl. 56-10.800.
Connelly, Lawrence: *See—*
Winegeart, Mitchell E.; and Connelly, Lawrence, 4,456,217, Cl. 251-58.000.
Conner, Randall C., to American Cast Iron Pipe Company. Snap ring and restrained pipe joint using said snap-ring. 4,456,288, Cl. 285-321.000.
Connolly, Richard S.: *See—*
Tippins, George W.; Thomas, John E.; Connolly, Richard S.; Pine, Charles K.; and Pottmeyer, Wayne G., 4,455,848, Cl. 72-12.000.
Conoco Inc.: *See—*
Yang, Kang, 4,456,697, Cl. 502-171.000.
Conover, Richard A. Apparatus for laying paving fabric. 4,456,399, Cl. 404-100.000.
Conradi, Robert A.: *See—*
Anderson, Bradley D.; and Conradi, Robert A., 4,456,602, Cl. 424-243.000.
Consolidated Natural Gas Service Company: *See—*
Huebler, James E.; and Craig, Jeffrey M., 4,455,863, Cl. 73-40.50A.
Constantine, Walter F.: *See—*
Kushner, James; Constantine, Walter F.; Radadia, Dhiru; and Codega, Louis S., 4,456,785, Cl. 174-105.0SC.
Container Corporation of America: *See—*
Helms, Charles R., 4,456,146, Cl. 220-270.000
Contensou, Claude: *See—*
Alavoine, Jacques J.; Contensou, Claude; Hardy, Pierre M.; and Neveux, Francis H., 4,456,205, Cl. 244-110.00C.
Cook, R. James: *See—*
Weller, David M.; Cook, R. James; and Wilkinson, Henry T., 4,456,684, Cl. 435-34.000.
Cooke, Bobby J.: *See—*
Franck, William F., III; and Cooke, Bobby J., 4,455,954, Cl. 112-262.300.
Cooper, Christopher: *See—*
Wheeler, Donald J.; Cooper, Christopher; and Krejsa, Charles R., 4,456,189, Cl. 242-55.000.
Cooper, Leonard. Apparatus for containment of carbonated beverages. 4,456,134, Cl. 215-12.00R.
Cooper, Paul V., to Plessey Overseas Limited. Magnetic bubble device. 4,456,974, Cl. 365-2.000.
Cordis Corporation: *See—*
Miles, Marshall, 4,456,017, Cl. 128-772.000.
Cordy, Clifford B., Jr., to Hewlett-Packard Company. Current spike protection circuit for switch-mode power supplies. 4,456,950, Cl. 363-26.000.
Corning Glass Works: *See—*
Dumbaugh, William H., Jr.; and Tyndell, Brian P., 4,456,692, Cl. 501-41.000.
Cornu, Jozef: *See—*
Chea, Ramon C. W., Jr.; Das, Santanu; Upp, Daniel C.; Cornu, Jozef; Danneels, Johan M. R.; and Taeymans, Jean R. J. M., 4,456,991, Cl. 370-58.000.
Coschieri, Jean C.: *See—*
Guillon, Jean C.; Coschieri, Jean C.; Duret, Bernard; and Van den Driessche, Michel, 4,456,928, Cl. 358-181.000.
Cosco, Inc.: *See—*
Knoedler, Roy E.; and Basey, Otis J., 4,456,302, Cl. 297-488.000.
Cosic, Ivan. Fishing rod holder apparatus. 4,455,779, Cl. 43-17.000.
Cotte, Andre, to Etablissements Marcel Cotte. Method of flushly embedding an inlay. 4,456,576, Cl. 264-255.000.
Cotton Incorporated: *See—*
Jones, Joseph K., 4,455,713, Cl. 19-80.00R.
Couch, Robert P.: *See—*
Bullis, Robert H.; Kimberley, John A.; and Couch, Robert P., 4,456,883, Cl. 324-464.000.
Coulter Systems Corporation: *See—*
Szymanski, Michael J.; Weber, Harold J.; Kuehnle, Manfred R.; and Fraser, Kenneth D., 4,456,367, Cl. 355-10.000.
Council, Buford W., Jr., to Bausch & Lomb Incorporated. Apparatus for controlling lathed contact lens thickness. 4,455,901, Cl. 82-12.000.
Counts, Lowell R.; and McFall, L. Victor. Conveyor unloading apparatus. 4,456,419, Cl. 414-398.000.
Coupland, Keith: *See—*
Habeeb, Jacob J.; and Coupland, Keith, 4,456,509, Cl. 204-59.00R.
Courtney-Pratt, Jeofry S., to Bell Telephone Laboratories, Incorporated. Voice switching arrangement for telephone conferencing. 4,456,792, Cl. 179-18.0BC.

Cousse, Henri: *See—*
Mouzin, Gilbert; Cousse, Henri; and Vilain, Pol, 4,456,614, Cl. 424-278.000.
Couture, Paul A.: *See—*
Jentoft, Arthur P.; and Couture, Paul A., 4,455,799, Cl. 52-200.000.
Covington, Wayne F.: *See—*
Olander Jr., Emil E.; James, Rex I.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,456,964, Cl. 364-710.000.
Cox, Charles H., III: *See—*
Warner, Thomas H.; and Cox, Charles H., III, 4,456,880, Cl. 324-158.00D.
Cox, Roger B.; and Steer, David C., to Lever Brothers Company. Microbial heteropolysaccharide. 4,456,714, Cl. 524-56.000.
Craelius AB: *See—*
Lagerstedt, Arne; and Lidstrand, Eskil, 4,456,077, Cl. 173-147.000.
Craig, Jeffrey M.: *See—*
Huebler, James E.; and Craig, Jeffrey M., 4,455,863, Cl. 73-40.50A.
Crawford, Alexander, to Massey-Ferguson Industries Limited. Method and apparatus for delivering twine to a baler knotter. 4,455,930, Cl. 100-3.000.
Crespin, M. Joel, to L'Unite Hermetique. Axial ventilator with protected blades. 4,456,431, Cl. 416-189.000.
Cricchi, James R.: *See—*
Williams, David W.; and Cricchi, James R., 4,455,742, Cl. 29-576.00B.
Cristofano, Anthony A.: *See—*
Otsuka, Tsuruo; and Cristofano, Anthony A., 4,455,932, Cl. 100-214.000.
Critikon, Inc.: *See—*
Blackburn, Gary F., 4,456,522, Cl. 204-416.000.
Cronin, Michael J., to Lockheed Corporation. AC Motor-starting for aircraft engines using APU free turbine driven generators. 4,456,830, Cl. 290-27.000.
Crooks, Walter; Hafer, Cameron H.; and Weiche, William J., to International Business Machines Corporation. Print head for high resolution electrothermal printing apparatus. 4,456,915, Cl. 346-76.0PH.
Crosbie, Gary M.; Tennenhouse, Gerald J.; Tischer, Ragnar P.; and Wroblowa, Halina S., to Ford Motor Company. Electronically conductive lithia doped oxide ceramics for use in sodium sulfur batteries. 4,456,631, Cl. 429-104.000.
Crosbie, Gary M.; Tennenhouse, Gerald J.; Tischer, Ragnar P.; and Wroblowa, Halina S., to Ford Motor Company. Electronically conductive magnesia doped oxide ceramics for use in sodium sulfur batteries. 4,456,664, Cl. 429-104.000.
Crotti, Aldo: *See—*
Grilli, Walter; Crotti, Aldo; and Berselli, Orlando, 4,456,041, Cl. 141-329.000.
Crowley, Richard P.: *See—*
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Cselt Centro Studi'e Laboratori Telecomunicazioni S.p.A.: *See—*
Castellino, Paolo; and Rusina, Fulvio, 4,457,013, Cl. 381-46.000.
Cukor, Peter: *See—*
Lee, Kang I.; Jensen, William; and Cukor, Peter, 4,456,678, Cl. 430-279.000.
Cullick, Alvin S.; Mathis, Melwyn L.; and Warner, Bert J., to Mobil Oil Corporation. Method and apparatus for determining CO_2 minimum miscibility pressure of reservoir oil. 4,455,860, Cl. 73-19.000.
Cummins Engine Company, Inc.: *See—*
Davenport, Clair H.; Combs, Richard B.; and Wilber, Dennis A., 4,455,865, Cl. 73-116.000.
Shapiro, Wilbur; and Bupara, Sargit S., 4,455,974, Cl. 123-47.00R.
Cunningham, Eldon R., to General Electric Company. Dynamoelectric machine, bearing devices, wick and bearing assemblies. 4,456,845, Cl. 310-90.000.
Cureton, Robert R.: *See—*
McMillan, Stephen L.; and Cureton, Robert R., 4,455,844, Cl. 68-18.00F.
Curle, Pierre W. Tarpaulin anchoring system. 4,455,790, Cl. 52-4.000.
Curlee, Thomas O., III: *See—*
Bullions, Robert J., III; Curlee, Thomas O., III; Gum, Peter H.; McGilvray, Bruce L.; and Richardson, Ethel L., 4,456,954, Cl. 364-200.000.
Cuschera, Casper. Self-contained, two-piece gasket seal assembly for drains. 4,455,693, Cl. 4-286.000.
Cuvillier, Michel L., to S.N.E.C.M.A. Apparatus for cooling turbine blades. 4,456,428, Cl. 416-97.00R.
Cyclodynamics of Colorado, Inc.: *See—*
Carpenter, Alan E., 4,456,277, Cl. 280-282.000.
Dabringhaus, Gustav H., to Gustav Dabringhaus Revocable Trust. Wave motor. 4,455,824, Cl. 60-507.000.
Daimler-Benz Aktiengesellschaft: *See—*
Buter, Hermann, 4,456,167, Cl. 236-345.000.
Wahr, Johannes; and Kling, Guenter, 4,455,785, Cl. 49-488.000.
Wuchter, Gerhard, 4,455,839, Cl. 60-737.000.
Dainippon Ink and Chemicals, Inc.: *See—*
Nambu, Junji; Yoshino, Kenji; Ariga, Nagao; Shimazu, Kyotaro; and Sato, Hiroyuki, 4,456,732, Cl. 525-65.000.
Daitzman, Reid J. Method of playing a board game. 4,456,261, Cl. 273-271.000.
Daley, Lawrence R.: *See—*
Christie, Frederick R.; and Daley, Lawrence R., 4,456,712, Cl. 523-439.000.
Dallaserra, Arthur B., to Iseto Shiko Co., Ltd. Process and apparatus for manufacturing continuous sealed postal or other envelope assemblies. 4,455,809, Cl. 53-435.000.
Dammig, Joachim: *See—*
Goldammer, Georg; Mahrt, Gunter; and Dammig, Joachim, 4,455,714, Cl. 19-81.000.
Damratowski, Leonard P., to Elliott Turbomachinery Company, Inc. Coupling and method of assembly and disassembly. 4,456,396, Cl. 403-15.000.
Dancsi, Lajos: *See—*
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo , 4,456,607, Cl. 424-262.000.
Danneels, Johan M. R.: *See—*
Chea, Ramon C. W., Jr.; Das, Santanu; Upp, Daniel C.; Cornu, Jozef; Danneels, Johan M. R.; and Taeymans, Jean R. J. M., 4,456,991, Cl. 370-58.000.
Dario, Paolo: *See—*
De Rossi, Danilo E.; Galletti, Pierre M.; and Dario, Paolo, 4,456,013, Cl. 128-675.000.
Darley, Henry M.: *See—*
Houston, Theodore W.; Tasch, Al F., Jr.; Darley, Henry M.; and Fu, Horng S., 4,455,738, Cl. 29-571.000.
Das, Santanu: *See—*
Chea, Ramon C. W., Jr.; Das, Santanu; Upp, Daniel C.; Cornu, Jozef; Danneels, Johan M. R.; and Taeymans, Jean R. J. M., 4,456,991, Cl. 370-58.000.
Data General Corp.: *See—*
El-Gohary, Hussein T.; Vaillette, Gary P.; and Nelson, Keith F., 4,456,956, Cl. 364-200.000.
Data Packaging Corporation: *See—*
Lyman, George, 4,456,137, Cl. 215-230.000.
Datafile Limited: *See—*
Pfeffer, George B., 4,457,016, Cl. 382-59.000.
Date, Sadao: *See—*
Kawakita, Takao; Yamaguchi, Kazuo; and Date, Sadao, 4,456,577, Cl. 419-7.000.
Davenport, Clair H.; Combs, Richard B.; and Wilber, Dennis A., to Cummins Engine Company, Inc. Method and device for locating a fixed point of reference relative to a predetermined segment of rotary member. 4,455,865, Cl. 73-116.000.
Davenport, William G.: *See—*
Harris, Ralph; and Davenport, William G., 4,456,479, Cl. 75-63.000.
Davis, Donald E.: *See—*
Cann, George W.; Davis, Donald E.; and Trotter, Ralph R., 4,456,860, Cl. 318-561.000.
Davis, Eugene E.; and Burton, George W., to Johnsen & Jorgensen (Plastics) Ltd. Tamper resistant fitment for a container. 4,456,143, Cl. 220-214.000.
Dawson, Marcia I.; and Chan, Rebecca L. S., to SRI International. Naphthenic and heterocyclic retinoic acid analogues. 4,456,618, Cl. 424-308.000.
Dayen, Leonid: *See—*
Hanks, James V.; and Dayen, Leonid, 4,456,110, Cl. 192-82.00T.
De Havilland Aircraft of Canada, Limited, The: *See—*
Gilbertson, Frederick L., 4,456,458, Cl. 55-306.000.
de Boer, Sibbele: *See—*
Gozeling, Jacobus A.; de Boer, Sibbele; and Spiering, Abraham A., 4,456,083, Cl. 175-415.000.
Defaut, Bernard: *See—*
Henry, Raymond; Simon, Jacques; Levy, Daniele; Carpenter, Jean-Francois; and Defaut, Bernard, 4,456,334, Cl. 350-320.000.
Degussa Aktiengesellschaft: *See—*
Effenberger, Franz; and Beisswenger, Thomas, 4,456,766, Cl. 560-17.000.
Malikowski, Willi; Szulczyk, Andreas; Bohm, Wolfgang; and Wolmer, Roger, 4,456,662, Cl. 428-632.000.
de Jong, Wybrand A., to Estel Hoogovens BV. Connection arrangement for a spout and an immersion nozzle, both of refractory material. 4,456,157, Cl. 222-591.000.
Dellea, Mario, to Societe Suisse pour l'Industrie Horlogere Management Services S.A. Timepiece having a divider chain with an adjustable division rate. 4,456,386, Cl. 368-201.000.
Del Signore, Leonello: *See—*
Caporossi, Adolfo; and Del Signore, Leonello, 4,456,731, Cl. 525-61.000.
Delta Development Group Internat'l., Inc.: *See—*
Fromme, Klaus; and Hagen, James, 4,455,703, Cl. 14-71.300.
DeMarco, Ronald A.; and Moran, Michael J., to United States of America, Navy. Preparation of simple nitronium salts. 4,456,583, Cl. 423-277.000.
Denham, Dan F.: *See—*
Robinder, Ronald C.; Bates, David J.; and Denham, Dan F., 4,456,853, Cl. 313-421.000.
Denison, John F., to Wilson Jones Company. Non-magnetic line guide unit for copy holder. 4,455,773, Cl. 40-352.000.
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Amberkar, Suresh D., 4,456,632, Cl. 427-124.000.
Russell, David B., 4,456,123, Cl. 206-343.000.
Russell, David B., 4,456,161, Cl. 227-67.000.
Swayze, Kenneth, 4,456,422, Cl. 414-744.00A.
De Rossi, Danilo E.; Galletti, Pierre M.; and Dario, Paolo, to Brown University Research Foundation. Catheter. 4,456,013, Cl. 128-675.000.

DeSantis, Alfred J.; and Schibinger, Joseph S., to Burroughs Corporation. System and method of renaming data items for dependency free code. 4,456,958, Cl. 364-200.000.

DeSantis, Raymond P.; and Puffer, Herbert J., Jr., to PTX-Pentronix, Inc. Mounting structure for die, punch and core rod assembly for compacting powder material. 4,456,445, Cl. 425-78.000.

Design Engineering Service Inc.: *See*—
Rabotski, John, 4,456,443, Cl. 425-4.00R.

De Simone, Pantaleo, to Ing. C. Olivetti & C., S.p.A. Original feeder for copying machines. 4,456,243, Cl. 271-245.000.

Detwiler, Donna. Compound archery target. 4,456,264, Cl. 273-404.000.

Deutsche Texaco Aktiengesellschaft: *See*—
Neier, Wilhelm; Webers, Werner; and Ostwald, Wolf, 4,456,776, Cl. 568-899.000.

Deverell, Harry E.; and McCuna, Thomas H., to Allegheny Ludlum Steel Corporation. Ferritic stainless steel. 4,456,483, Cl. 75-128.00N.

Dhein, Rolf; Backer, Lothar; and Schoeps, Jochen, to Bayer Aktiengesellschaft. Binders for aqueous stoving lacquers based on polyesters and a process for the production thereof. 4,456,729, Cl. 524-542.000.

Dhein, Rolf: *See*—
Eimers, Erich; Dhein, Rolf; and Kircher, Klaus, 4,456,717, Cl. 524-109.000.

Diamond Communication Products, Inc.: *See*—
Leonardo, Ignazio, 4,455,716, Cl. 24-115.00A.

Diamond Shamrock Corporation: *See*—
Solomon, Frank; and Grun, Charles, 4,456,521, Cl. 204-292.000.

Dickie, Ray A.: *See*—
Holubka, Joseph W.; and Dickie, Ray A., 4,456,738, Cl. 525-454.000.
Holubka, Joseph W.; and Dickie, Ray A., 4,456,739, Cl. 525-510.000.
Holubka, Joseph W.; and Dickie, Ray A., 4,456,740, Cl. 525-528.000.

DiDomenico, Edward, Jr., to Henkel Corporation. High solids coating composition based on bishydroxymethyl tricyclo polyols. 4,456,737, Cl. 525-398.000.

DiDomenico, Edward, Jr., to Henkel Corporation. High solids coating compositions based on cycloaliphatic diols. 4,456,747, Cl. 528-254.000.

Dika, John A.; and Juengst, Fredrick W., Jr., to Calor Agriculture Research, Inc. Ruminant animal feed and method of making same. 4,456,623, Cl. 426-69.000.

Dilay, Walter: *See*—
Schumacher, Berthold W.; and Dilay, Walter, 4,456,810, Cl. 219-110.000.

DiMassimo, Donald V.; and May, John B., to General Electric Company. Non-complementary metal oxide semiconductor (MOS) driver for liquid crystal displays. 4,456,910, Cl. 340-784.000.

Dinius, Harold B.: *See*—
McKnight, Hugh P.; Welty, Kenneth B.; and Dinius, Harold B., 4,456,115, Cl. 198-377.000.

Dirck, Benny L. Multiple connection trailer hitch. 4,456,279, Cl. 280-415.00A.

Discovision Associates: *See*—
Gardiner, Mark E.; and Kuntz, David W., 4,456,375, Cl. 356-239.000.
Winslow, John S., 4,456,914, Cl. 346-76.00L.

Divirgilio, Ralph F.: *See*—
Salter, Lowell S., Jr.; Divirgilio, Ralph F.; and Brickey, Russell A., 4,455,856, Cl. 72-236.000.

Dixon Automatic Tool, Inc.: *See*—
Rose, Robert F.; and Manning, Lonnie W., 4,456,822, Cl. 250-223.00R.

Dnepropetrovsky Khimiko-Tekhnologichesky Institut Imeni F. E. Dzerzhinskogo: *See*—
Mamrosov, Alexandr D.; Fedulov, Oleg V.; Kolivashko, Alexandr S.; Meniovich, Boris I.; and Neboga, Vladimir A., 4,456,175, Cl. 239-113.000.

Dobbs, Robert J.: *See*—
Benjamin, Mary L.; Dobbs, Robert J.; and Shaffer, Mary E., 4,456,484, Cl. 75-252.000.

Doellinger, Rolf; and Schindler, Rudolf, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Method for impregnating reinforcing fiber materials with a resinous binder material. 4,456,495, Cl. 156-166.000.

Doenges, Michael G.: *See*—
Glantz, Jerome J.; and Doenges, Michael G., 4,456,624, Cl. 426-96.000.

Doi, Shuhei: *See*—
Fukumura, Mikio; Shibata, Hideo; Doi, Shuhei; Isaka, Tsutomu; and Inoue, Takayuki, 4,456,704, Cl. 521-79.000.

Dome Petroleum Limited: *See*—
O'Rourke, J. Cam; Marshall, Robert E.; Bercha, Frank G.; and Pilkington, G. Roger, 4,455,958, Cl. 114-40.000.

Doty, Francis D., to University of South Carolina. High speed cylindrical nuclear magnetic resonance (NMR) sample spinner. 4,456,882, Cl. 324-321.000.

Dow Chemical Company, The: *See*—
Bieler, Barrie H.; Morgan, David C.; and Stringham, Robert R., 4,456,512, Cl. 204-162.00R.
Messelt, Christopher D.; and Townsend, Glenda P., 4,456,751, Cl. 536-91.000.

Doweyko, Arthur M. P.; Regis, Richard R.; and Bell, Allyn R., to Uniroyal, Inc. Herbicidal 2-(alpha-chloromethylsulfonyl) pyridine-1-oxides. 4,456,470, Cl. 71-94.000.

Downing, Roy W.: *See*—
Reimels, Harry G.; Cerundolo, Daniel G.; and Downing, Roy W., 4,456,010, Cl. 128-310.000.

Doyle, Terrence W.: *See*—
Schmitz, Henry; Kaneko, Takushi; Essery, John M.; and Doyle, Terrence W., 4,456,765, Cl. 549-332.000.

Dozono, Tetsuro: *See*—
Katsumata, Tsutomu; Dozono, Tetsuro; and Honda, Makoto, 4,456,563, Cl. 260-465.80R.

Drabek, Jozef, to Ciba-Geigy Corporation. Pesticidal N-(3-trimethylstannylalkylene)-N'-phenyl-sulfonyl or -benzoyl-ureas. 4,456,559, Cl. 260-429.700.

Drackett Company, The: *See*—
Hegge, Robert A.; and Jones, David A., 4,455,692, Cl. 4-228.000.

Dresser Industries, Inc.: *See*—
Houtz, Kenneth E., 4,456,311, Cl. 303-10.000.
Schoonover, Larry G., 4,456,983, Cl. 367-69.000.

Drinkard, Tye C.: *See*—
Jones, Philip N.; and Drinkard, Tye C., 4,456,321, Cl. 339-97.00R.

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Drower, Herbert M.; and Minkus, Morton, to Sealtran Corporation. Laminating film of thermoset polyester resin with external layer of embossable thermoplastic resin. 4,456,639, Cl. 428-13.000.

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Due, Joseph E. Machine and method for grooving pavement. 4,456,303, Cl. 299-10.000.

Dugan, John M., to Rockwell International Corporation. Fiber optic connector tool. 4,455,729, Cl. 29-235.000.

Dugan, Patrick R.; and Apel, William A., to Ohio State University, The. Microbiological desulfurization of coal. 4,456,688, Cl. 435-267.000.

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Pichler, Heinrich; and Dum, Hermann, 4,456,835, Cl. 307-107.000.

Dumbaugh, William H., Jr.; and Tyndell, Brian P., to Corning Glass Works. Bi_2O_3—Ga_2O_3 Glasses. 4,456,692, Cl. 501-41.000.

Du Pont de Nemours, E. I., and Company: *See*—
Adams, John B., Jr., 4,456,469, Cl. 71-93.000.
Beasley, John K.; and Urban, Edward J., 4,456,655, Cl. 428-383.000.
Ciskowski, James M., 4,456,676, Cl. 430-264.000.
Switten, Jan M. B., 4,455,850, Cl. 72-46.000.
Wang, Chia-Lin J., 4,456,613, Cl. 424-274.000.

Duret, Bernard: *See*—
Guillon, Jean C.; Coschieri, Jean C.; Duret, Bernard; and Van den Driessche, Michel, 4,456,928, Cl. 358-181.000.

Durr, Frederick E.: *See*—
Murdock, Keith C.; and Durr, Frederick E., 4,456,552, Cl. 260-377.000.

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Durst, Jack R., to Pillsbury Company, The. Storage stable, ready-to-eat baked goods. 4,456,625, Cl. 426-106.000.

Dutta, Subhadra; and Raichoudhury, Prosenjit, to Westinghouse Electric Corp. Laser annealing of MIS devices by back surface laser treatment. 4,456,490, Cl. 148-1.500.

Dvorak, Harold F.; and Senger, Donald R., to President and Fellows of Harvard College. Vascular permeability factor. 4,456,550, Cl. 260-112.00R.

Dydyk, Michael, to Motorola Inc. Two diode image rejection and pseudo-image enhancement mixer. 4,457,022, Cl. 455-317.000.

Dymon, Thaddeus S. Clip-on attachment for conserving water during the flushing of a toilet. 4,455,694, Cl. 4-325.000.

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Christmann, Wolfgang; Lindner, Gerhard; and Lingens, Paul, 4,455,914, Cl. 86-1.00R.

Dyrna, Peter: *See*—
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E.D. Bullard Company: *See*—
Moretti, Anthony L., 4,455,683, Cl. 2-2.000.

E. R. Squibb & Sons, Inc.: *See*—
Krapcho, John, 4,456,761, Cl. 548-532.000.
Nakane, Masami; Snitman, David L.; Reid, Joyce; and Haslanger, Martin F., 4,456,615, Cl. 424-285.000.
Nakane, Masami; and Haslanger, Martin F., 4,456,617, Cl. 424-285.000.
Weller, Harold N., III; and Gordon, Eric M., 4,456,595, Cl. 424-177.000.
Wood, Thomas G.; and Oblack, Steven M., 4,456,629, Cl. 427-3.000.
YHaslanger, Martin F.; Nakane, Masami; and Hall, Steven E., 4,456,616, Cl. 424-285.000.

Earle, John L. Windmill power apparatus and method. 4,455,834, Cl. 60-659.000.

Eary, George D., Sr. Adjustable upper body rest. 4,455,698, Cl. 5-436.000.

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Kremer, Ann S., 4,456,179, Cl. 239-338.000.

Eastman Kodak Company: *See*—
Ames, William A., 4,456,741, Cl. 526-264.000.
Weaver, Max A.; and Coates, Clarence A., Jr., 4,456,551, Cl. 260-158.000.

Eaton Corporation: *See*—
Klein, Gary S., 4,456,784, Cl. 174-23.00R.
Kotian, Vijayraj M., 4,456,654, Cl. 428-383.000.
Radcliffe, Thomas R., 4,455,883, Cl. 74-475.000.

Eberle, George F. Wood I-beam and method of fabricating the same. 4,456,497, Cl. 156-257.000.

Ebling, Wendell V., to Bentley Laboratories, Inc. Flow control apparatus. 4,456,223, Cl. 251-342.000.

Echols, John B.: *See*—
Swift, Edward R., Jr.; and Echols, John B., 4,456,061, Cl. 166-75.00R.

Eckley, Gordon P.: *See*—
Carrington, Wilbur A.; Fredricks, Ronald J.; Gubbins, Harry L.; Eckley, Gordon P.; Perfitt, Thomas E.; and Page, Jerry L., 4,456,376, Cl. 356-350.000.

Eckloff, Willi: *See*—
Pietsch, Hanns; Hohmann, Volker; and Eckloff, Willi, 4,456,711, Cl. 523-206.000.

Edelmann, Hermann; Pasch, Manfred; Klose, Sigmar; Haar, Hans-Peter; and Mann, Karlheinz, to Boehringer Mannheim GmbH. Centrifugal analyzer rotor unit and insert elements. 4,456,581, Cl. 422-72.000.

Edge, Brian A.: *See*—
Newman, Alec T.; Rhodes, David; and Edge, Brian A., 4,456,148, Cl. 221-132.000.

Eduard Kusters Maschinenfabrik: *See*—
Schiffer, Gunter, 4,455,845, Cl. 68-204.000.

Edwards, Timothy J.: *See*—
Arns, James A.; Edwards, Timothy J.; Moss, Gaylord E.; and Wreede, John E., 4,456,328, Cl. 350-3.600.

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Eguchi, Yoshitugu; Matsumoto, Osamu; and Imada, Kiyoshi, to Shin-Etsu Chemical Co., Ltd. Method for the preparation of a foamed body of a vinyl chloride-based resin composition. 4,456,572, Cl. 264-53.000.

Ehrenfried, Ted R. Leg stretching apparatus. 4,456,247, Cl. 272-126.000.

Ehrlich, Donald J., to Evans Products Company. Splice rail assembly. 4,455,807, Cl. 52-770.000.

Eickmann, Karl. Vehicle employing a fluid motor with arrangements. 4,456,430, Cl. 416-170.00R.

Eidenschink, Rudolf: *See*—
Weber, Georg; Eidenschink, Rudolf; and Erdmann, Dietrich, 4,456,545, Cl. 252-299.100.

Eikemeier, Siegfried: *See*—
Bochow, Richarda; Bergmann, Helmut; and Eikemeier, Siegfried, 4,456,667, Cl. 430-10.000.

Eilingsfeld, Heinz; Etzbach, Karl-Heinz; Hoffmann, Gerhard; and Neumann, Peter, to BASF Aktiengesellschaft. Electrophotographic recording materials containing triazole charge carrier-transporting compounds. 4,456,672, Cl. 430-59.000.

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Eisai Co., Ltd.: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,456,558, Cl. 260-413.000.
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,456,603, Cl. 424-248.570.

Eisen- und Drahtwerk Erlau Aktiengesellschaft: *See*—
Muller, Anton, 4,456,233, Cl. 267-70.000.

Eklund, Vidar: *See*—
Mandell, Leo; Eklund, Vidar; Ekman, Kurt; Huttunen, Jouko; and Turunen, Olli, 4,456,749, Cl. 536-30.000.

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Pescatore, Eugene A., 4,456,001, Cl. 128-1.500.

Elektra Energie A.G.: *See*—
Heim, Werner; Wolf, Fritz J.; and Savery, Winsor T., 4,456,065, Cl. 166-248.000.

Elevitch, Franklin R. Coffee roaster. 4,455,763, Cl. 34-233.000.

El-Gohary, Hussein T.; Vaillette, Gary P.; and Nelson, Keith F., to Data General Corp. Method and apparatus for controlling access of a network transmission bus between a plurality of spaced apart computer stations. 4,456,956, Cl. 364-200.000.

Eli Lilly and Company: *See*—
McKnight, Hugh P.; Welty, Kenneth B.; and Dinius, Harold B., 4,456,115, Cl. 198-377.000.

El Ibiary, Yehia, to Vickers, Incorporated. Power transmission. 4,456,434, Cl. 417-218.000.

Elkay Manufacturing Company: *See*—
Bisonaya, Rudy, 4,456,287, Cl. 285-281.000.

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Skaiaa, Leif, 4,455,712, Cl. 17-23.000.

Elko, George A.; and O'Brien, Charles B. Protective cover for gutters. 4,455,791, Cl. 52-12.000.

Elliott Turbomachinery Company, Inc.: *See*—
Damratowski, Leonard P., 4,456,396, Cl. 403-15.000.
Idzik, Joseph J.; Kouse, Charles H.; and Herzog, James L., 4,455,746, Cl. 30-106.000.
Straslicka, William A., 4,456,032, Cl. 137-630.190.

Elmore, Austin E.: *See*—
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Emhart Industries, Inc.: *See*—
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Shedigian, Vandos, 4,456,945, Cl. 361-305.000.

EMI Limited: *See*—
Knott, John, 4,456,191, Cl. 242-68.100.

Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, to Nissan Motor Company, Limited. Plasma ignition system for internal combustion engine. 4,455,989, Cl. 123-620.000.

Energy Research Corporation: *See*—
Chi, Chang V., 4,456,645, Cl. 428-166.000.

Energy Sciences Partners, Ltd.: *See*—
Maes, Michel E.; Shaw, Robert L.; and Reinsch, Royal L., 4,456,494, Cl. 149-21.000.

Engel, Hinrich; Koch, Eckhard; and Vogg, Gunther, to MBB/VFW GmbH. Turning a pallet or container. 4,456,207, Cl. 244-137.00R.

Engelmann, Manfred; Klippert, Heinz; and Tzschoppe, Eberhard, to Hoechst Aktiengesellschaft. Continuous process for the production of vinyl chloride polymers in aqueous suspension. 4,456,735, Cl. 525-317.000.

Enlow, William P.: *See*—
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Ensley, Donald L., to Harvest Queen Mill & Elevator Company. High energy microwave defense system. 4,456,912, Cl. 343-6.00R.

Erdmann, Dietrich: *See*—
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Ermolovich, Vyacheslav I.; Klushin, Valery A.; Sadko, Vladimir I.; and Schukin, Valery Y., to Fiziko-Tekhnichesky Institut Akademii Nauk Belorusskoi SSR. Mill for transverse rolling. 4,455,854, Cl. 72-90.000.

Ernst Leitz Wetzlar GmbH: *See*—
Fritsche, Rainer; Jacoby, Hans-Dieter; and Schuster, Erich, 4,455,755, Cl. 33-174.00L.
Kraft, Winfried; Pfeifer, Gerhard; Reichel, Artur; and Richter, Kurt, 4,455,910, Cl. 83-874.000.

Ernst Wagner KG-Fordertechnik: *See*—
Harter, Walter; and Schumacher, Karl, 4,456,418, Cl. 414-351.000.

Escher Wyss GmbH: *See*—
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Esso Resources Canada Ltd.: *See*—
Lorenz, Gordon; and Gehring, Ken, 4,456,536, Cl. 210-776.000.

Estel Hoogovens BV: *See*—
de Jong, Wybrand A., 4,456,157, Cl. 222-591.000.
Gozeling, Jacobus A.; de Boer, Sibbele; and Spiering, Abraham A., 4,456,083, Cl. 175-415.000.

Etablissements Francois Salomon Et Fils S.A.: *See*—
Salomon, Georges P. J., 4,455,768, Cl. 36-121.000.

Etablissements M. Muller et Cie: *See*—
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Etablissements Marcel Cotte: *See*—
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Ethyl Corporation: *See*—
Everly, Charles R.; and Roper, Jerry M., 4,456,771, Cl. 568-315.000.
Gautreaux, Marcelian F., 4,456,584, Cl. 423-644.000.
Hornbaker, Edwin D., 4,456,733, Cl. 525-71.000.
Rajan, Sundar J., 4,456,745, Cl. 528-85.000.
Thomas, Paul E.; and Raley, Garland E., 4,456,570, Cl. 264-22.000.
Wright, William E., 4,456,541, Cl. 252-50.000.

Ethyl Corportation: *See*—
Everly, Charles R.; and Roper, Jerry M., 4,456,770, Cl. 568-315.000.

Etzbach, Karl-Heinz: *See*—
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Eustacchio, Peter; and Koren, Erwin, to Maschinenfabrik Andritz Aktiengesellschaft. Apparatus for improving gravity dehydration in strainer belt presses. 4,456,530, Cl. 210-396.000.

Evans, Darrell L., to Atlantic Pacific Marine Corporation. Method and apparatus for positioning a working barge above a sea surface. 4,456,404, Cl. 405-196.000.

Evans, Dennis C.; Nicoll, Robert A.; and Gladden, Robert E., to General Electric Company. Cooling air injector for turbine blades. 4,456,427, Cl. 416-95.000.

Evans, Hawley R.; and Howe, Charles B., to Snorkel Stove Co. Heating unit for hot tubs and/or spa units. 4,455,997, Cl. 126-367.000.

Evans Products Company: *See*—
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Everly, Charles R.; and Roper, Jerry M., to Ethyl Corportation. Chemical process for preparing 1,3 diketones. 4,456,770, Cl. 568-315.000.

Everly, Charles R.; and Roper, Jerry M., to Ethyl Corporation. Chemical process for preparing 1,3-diketones. 4,456,771, Cl. 568-315.000.

Ex-Cell-O Corporation: *See*—
Kauffman, Ivan L.; and Allen, Robert J., 4,456,118, Cl. 198-480.000.

Exxon Production Research Co.: *See*—
Fowler, Joe R.; Hitchcock, Wilbur A.; and Miller, Jack E., 4,456,073, Cl. 166-367.000.

Exxon Research and Engineering Co.: *See*—
Aldridge, Clyde L., 4,456,703, Cl. 502-335.000.
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Falchle, Jorg: *See*—
Schmid, Wolfgang; Wanner, Karl; Falchle, Jorg; Bleicher, Manfred; and Muller, Frank, 4,456,076, Cl. 173-116.000.
Fanuc Ltd.: *See*—
Imazeki, Ryoji; Yamazaki, Etsuo; and Sasaki, Takao, 4,456,864, Cl. 318-578.000.
Yamamura, Sakae; and Kawada, Shigeki, 4,456,868, Cl. 318-800.000.
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Faulkner, Richard D.; and Henry, Dale V., to RCA Corporation. Mesh structure for a photomultiplier tube. 4,456,852, Cl. 313-348.000.
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Fedulov, Oleg V.: *See*—
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Ferroni, Frank A. L. Lamp wattage limiting device. 4,456,322, Cl. 339-153.000.
Ferry, Gene S.: *See*—
Scott, Daniel G.; and Ferry, Gene S., 4,456,219, Cl. 251-99.000.
Fiala, Ernst, to Volkswagenwerk Aktiengesellschaft. Method and arrangement for operation of an internal combustion engine of a vehicle. 4,455,983, Cl. 123-478.000.
Fiat Auto S.p.A.: *See*—
Mesnori, Pier P.; and Scapecchi, Pier L., 4,456,314, Cl. 308-236.000.
Fiat Trattori S.p.A.: *See*—
Prudenziati, Maria, 4,456,074, Cl. 172-7.000.
Fichtel & Sachs AG: *See*—
Limbacher, Bernhard, 4,456,111, Cl. 192-85.0CA.
Field, Leslie A.: *See*—
Buss, Waldeen C.; Field, Leslie A.; and Robinson, Richard C., 4,456,527, Cl. 208-89.000.
Finamore, Paul V., to Hairline Creations, Inc. Hairpiece and method of making same. 4,456,019, Cl. 132-5.000.
Findeisen, Kurt; and Schwarz, Herbert, to Bayer Aktiengesellschaft. Process for the preparation of acyl cyanides. 4,456,565, Cl. 260-545.00R.
Finic, B.V.: *See*—
Williams, Augustus, 4,456,401, Cl. 405-150.000.
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Possati, Mario, 4,456,130, Cl. 211-26.000.
Fink, Herbert: *See*—
Siol, Werner; Fink, Herbert; Klesse, Wolfgang; Rauch, Hubert; and Suetterlin, Norbert, 4,456,726, Cl. 524-501.000.
Finken, Elmer G. Engine fuel supply system. 4,455,986, Cl. 123-557.000.
Finley, David R.; and Beck, Laurence A., to Interstate Electronics Corp. Control system for aerial work platform machine and method of controlling an aerial work platform machine. 4,456,093, Cl. 182-2.000.
Finnern, David L., to Ryan, Joseph J., a part interest. Scuba tank weight strap. 4,455,718, Cl. 405-186.000.
Firey, Joseph C. Cyclic velox boiler. 4,455,837, Cl. 60-670.000.
Firth, James A.: *See*—
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Fischbach, Manfred; and Hebben, Rolf. Extrusion device for impregnating a rock formation, preferably for bonding with a liquid synthetic product. 4,456,438, Cl. 417-403.000.
Fisher, Charles B.; and Fisher, Sidney T. Periodic wave elimination by negative feedback. 4,456,990, Cl. 370-119.000.
Fisher, Robert P. Photochemical method for generating chlorine dioxide gas. 4,456,511, Cl. 204-157.10R.
Fisher, Sidney T.: *See*—
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Fletcher Sutcliffe Wild Limited: *See*—
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Flexivol, Inc.: *See*—
Apffel, Fred P., 4,456,460, Cl. 62-26.000.
Flohr, Joachim: *See*—
Schoettle, Klaus; Ilmer, Andreas; and Flohr, Joachim, 4,456,160, Cl. 226-195.000.
Flow Technology Corporation: *See*—
Bogosian, Armen, 4,456,030, Cl. 137-614.110.
Fluidised Bed Combustion (Proprietary) Limited: *See*—
Shoebotham, Neville M., 4,456,455, Cl. 48-85.200.
FMC Corporation: *See*—
Lee, Fui-Tseng H.; and Green, Joseph, 4,456,742, Cl. 528-45.000.
Lee, Fui-Tseng H.; and Green, Joseph, 4,456,743, Cl. 528-60.000.
Focht, Louis R.: *See*—
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Fock, Jurgen, to Th. Goldschmidt AG. Process for the preparation of polyoxyalkylene ethers. 4,456,773, Cl. 568-608.000.
Fohey, Donald R., to K. J. Law Engineers, Inc. Non-contact sensor, system and method with particular utility for measurement of road profile. 4,456,829, Cl. 250-560.000.
Foley, Lary L. Composition for control of bacteria and viruses. 4,456,722, Cl. 524-413.000.
Forbes, Brian K.: *See*—
Catiller, Robert D.; and Forbes, Brian K., 4,456,970, Cl. 364-900.000.
Ford, Lamar. Well bore wall cleaner. 4,456,064, Cl. 166-123.000.
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Ford Motor Company: *See*—
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Boruta, Thaddeus, 4,456,216, Cl. 251-11.000.
Crosbie, Gary M.; Tennenhouse, Gerald J.; Tischer, Ragnar P.; and Wroblowa, Halina S., 4,456,631, Cl. 429-104.000.
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Holubka, Joseph W.; and Dickie, Ray A., 4,456,738, Cl. 525-454.000.
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Holubka, Joseph W.; and Dickie, Ray A., 4,456,740, Cl. 525-528.000.
Lindre, Jaan, 4,456,098, Cl. 188-1.110.
Melotik, Donald J.; Weintraub, Marvin H.; and Anderson, Arnold E., 4,456,650, Cl. 428-290.000.
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Schumacher, Berthold W.; and Dilay, Walter, 4,456,810, Cl. 219-110.000.
Sutherland, Donald M., 4,456,802, Cl. 200-340.000.
Ford, Ronald; Ford, Vincent G.; and Ford, Martyn J., to Varitork Research Mechanism, Inc. Attachment for a vertical milling machine. 4,456,412, Cl. 409-233.000.
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Ford, Ronald; Ford, Vincent G.; and Ford, Martyn J., 4,456,412, Cl. 409-233.000.
Foreman, Arnal B., Jr.: *See*—
Bishop, Thomas R.; and Foreman, Arnal B., Jr., 4,456,215, Cl. 251-1.00B.
Forestier, Alain, to Telecommunications Radioelectriques et Telephoniques T.R.T. Off-hook detector with reduced sensitivity to common mode. 4,456,791, Cl. 179-18.0FA.
Forkel Michael; and Volk, Hans-Joachim, to Metallwerk Max Brose GmbH & Co. Positionally adjustable holding device for an engaging member of a safety belt. 4,456,283, Cl. 280-804.000.
Forster, Helmut, to Siemens Aktiengesellschaft. Rotating detector system with coolant supply. 4,456,826, Cl. 250-370.000.
Fortune, William S. Holder for electrically heated instruments and the like. 4,456,816, Cl. 219-242.000.
Foster, Malcolm C.: *See*—
Bottomley, Eric; and Foster, Malcolm C., 4,456,109, Cl. 192-18.00A.
Foster-Miller Associates, Inc.: *See*—
Burrill, Charles E., Jr.; Smirlock, Martin E.; and Krepchin, Ira P., 4,456,068, Cl. 166-303.000.
Foster, Peter D.; and Stowers, Clifford, to Keyes Fibre Company. Deliddable ovenable container. 4,456,164, Cl. 229-43.000.
Fowks, William R., to Rockwell International Corporation. Radio frequency source circuit primarily for igniting the lamp of a rubidium frequency standard. 4,456,891, Cl. 331-3.000.
Fowler, Joe R.; Hitchcock, Wilbur A.; and Miller, Jack E., to Exxon Production Research Co. Flexible connection apparatus. 4,456,073, Cl. 166-367.000.
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Blaskie, M. W.; Fox, J. R.; and Pesa, F. A., 4,456,694, Cl. 502-74.000.
Franck, William F., III; and Cooke, Bobby J., to Tultex Corp. Lateral position adjuster for edge margin of longitudinally conveyed flexible material. 4,455,954, Cl. 112-262.300.
Francovitch, Thomas F., to Single-Ply Institute of America, Inc. Membrane anchor. 4,455,804, Cl. 52-698.000.

Francu, Nicholas J. Bicycle seat adapter. 4,456,295, Cl. 297-211.000.
Frank, John R., to L. E. Mason Co. Weatherproof outlet cover. 4,456,145, Cl. 220-242.000.
Fraser, Howard H., Jr.; and Jacobs, John J., to Carrier Corporation. Protection device. 4,456,941, Cl. 361-105.000.
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Szymanski, Michael J.; Weber, Harold J.; Kuehnle, Manfred R.; and Fraser, Kenneth D., 4,456,367, Cl. 355-10.000.
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Gallusser, David O.; MacAvoy, David W.; Punako, Stephen; and Frear, David L., 4,456,320, Cl. 339-94.00M.
Fredricks, Ronald J.: *See*—
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Freenor, Francis J., III, to Chevron Research Company. 1-Methylene carbonyl derivatives of 3-aryloxy-4-phenyl-azet-2-one. 4,456,467, Cl. 71-88.000.
Freerks, Conrad T., to Minnesota Mining and Manufacturing Company. Abrasive wheel and drive spindle combination with improved attaching means. 4,455,788, Cl. 51-334.000.
Freis, Jean L.; Hauer, Jean C.; and Oger, Jacques, to Centre de Recherches de Pont A Mousson. Road inspection manhole. 4,456,397, Cl. 404-25.000.
French, Kenneth W.; Neil, Jeffrey T.; and Turnbaugh, Larry L., to GTE Laboratories Incorporated. Composition for injection molding. 4,456,713, Cl. 523-455.000.
Frey, David J.; and Wier, Keith E., to SXD Refractories. Method and apparatus for forming particles into shaped articles. 4,456,574, Cl. 264-71.000.
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Wagner, Wolfgang; Scherer, Matthias; Wegehaupt, Karl-Heinrich; and Frey, Volker, 4,456,542, Cl. 252-8.600.
Frias, Ronald J.; and Jagielski, David, to Micron Corporation. Reel-to-reel drive system. 4,456,201, Cl. 242-203.000.
Fried, Josef, to University of Chicago, The. Chemical synthesis. 4,456,768, Cl. 562-503.000.
Fried. Krupp Gesellschaft mit beschrankter Haftung: *See*—
Burmeister, Werner, 4,456,409, Cl. 407-104.000.
Friedl, Reiner, to Webasto-Werk W. Baier GmbH & Co. Vehicle heater. 4,456,171, Cl. 237-12.30C.
Friemert, Horst: *See*—
Haeusler, Jochen; Friemert, Horst; and Kutchukian, Remi, 4,456,292, Cl. 294-65.500.
Frischmann, Peter G., to General Electric Company. Thermal compensators for magnetic circuits. 4,456,898, Cl. 335-217.000.
Frito-Lay, Inc.: *See*—
Kreager, William D.; Mason, Stanley I., Jr.; and Wilson, Larry W., 4,455,810, Cl. 53-451.000.
Fritsch, Felix, to Koflach Sportgerate Gesellschaft m.b.H. Ski boot. 4,455,769, Cl. 36-121.000.
Fritsche, Rainer; Jacoby, Hans-Dieter; and Schuster, Erich, to Ernst Leitz Wetzlar GmbH. Apparatus for sensing test values at test samples. 4,455,755, Cl. 33-174.00L.
Fritzinger, George H. Vandalproof street name sign. 4,455,775, Cl. 40-607.000.
Fritzsche, Klaus: *See*—
Schumann, Frank; Richter, Hans-Jurgen; Stiefel, Werner; and Fritzsche, Klaus, 4,456,379, Cl. 356-381.000.
Froehlich, Fritz E.: *See*—
Baker, William E.; Froehlich, Fritz E.; and Mattes, Hans G., 4,456,793, Cl. 179-99.00R.
Froeschle, Thomas A., to Bose Corporation. Current controlled two-state modulation. 4,456,872, Cl. 323-286.000.
Fromme, Klaus; and Hagen, James, to Delta Development Group Internat'l., Inc. Dockboard assembly. 4,455,703, Cl. 14-71.300.
Fu, Horng S.: *See*—
Houston, Theodore W.; Tasch, Al F., Jr.; Darley, Henry M.; and Fu, Horng S., 4,455,738, Cl. 29-571.000.
Fuentes, Ricardo, Jr. Catalyst prepared from organomagnesium compound, organic hydroxyl-containing compound, reducing halide source and complex formed from admixture of a transition metal compound and an organozinc compound. 4,456,547, Cl. 502-117.000.
Fugakawa, Yasuo: *See*—
Okumura, Yasushi; Okamura, Kazuhiko; Fugakawa, Yasuo; Ishikura, Tomoyuki; Kouno, Kageaki; and Lein, Joseph, 4,456,592, Cl. 424-177.000.
Fuji Electric Co., Ltd.: *See*—
Nishiura, Masaharu; Sakai, Hiroshi; Miyagi, Masahide; Uchida, Yoshiyuki; and Haruki, Hiromu, 4,456,782, Cl. 136-244.000.
Tominaga, Hiroshi, 4,456,147, Cl. 221-67.000.
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Fuji Photo Film Co., Ltd.: *See*—
Ishikawa, Takatoshi; Mitsui, Akio; Morigaki, Masakazu; and Nakamura, Takashi, 4,456,682, Cl. 430-523.000.
Nakayama, Takao; Ohishi, Chikashi; Nakao, Sho; and Shiba, Keisuke, 4,456,670, Cl. 430-49.000.
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Yamaguchi, Toshimitsu, 4,456,239, Cl. 271-3.100.
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Fuji Xerox Co., Ltd.: *See*—
Kikuchi, Yoshiki; Ohmori, Takashi; Moriguchi, Haruhiko; and Nakajima, Hisao, 4,456,824, Cl. 250-318.000.
Fujibayashi, Kazuo, to Canon Kabushiki Kaisha. Thin type photographic lens system. 4,456,345, Cl. 350-469.000.
Fujihashi, Norikazu. Collapsible umbrella with water-tight sheathing handle. 4,456,023, Cl. 135-25.00R.
Fujimoto, Hideki: *See*—
Nishioka, Akira; Kawanabe, Yoshihiro; Fujimoto, Hideki; and Takahori, Hiroyuki, 4,456,886, Cl. 330-254.000.
Fujimura, Naoto: *See*—
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Sunouchi, Akio; Fujino, Masahisa; and Suzuki, Ryuji, 4,456,357, Cl. 354-266.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
Kondo, Takashi; Takagi, Kiyotaka; and Nishiyama, Taichiro, 4,456,380, Cl. 356-418.000.
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Fujitsu Fanuc Limited: *See*—
Imazeki, Ryoji; and Yamazaki, Etsuo, 4,456,962, Cl. 364-520.000.
Fujitsu Limited: *See*—
Ide, Tetsuo; and Iwamoto, Hiromu, 4,456,840, Cl. 307-362.000.
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Fukuda, Joji; and Okubo, Yutaka, to Sony Corporation. Semiconductor RAM that is accessible in magnetic disc storage format. 4,456,971, Cl. 364-900.000.
Fukui, Hiroshi: *See*—
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Fukushima, Masao; and Yazaki, Komei, to Nissan Motor Company, Limited. Engine mounting structure. 4,456,213, Cl. 248-559.000.
Fung, Anthony K.: *See*—
Plattner, Jacob J.; and Fung, Anthony K., 4,456,612, Cl. 424-272.000.
Furuike, Haruo H., to United States of America, Army. Random time delay fuze. 4,455,940, Cl. 102-228.000.
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Masaki, Nobuo; Tokuda, Hiroyuki; Furukawa, Yoshiki; Sakurai, Mitsuru; and Nitanda, Hiroshi, 4,456,362, Cl. 355-3.00R.
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Futaba Denshi Kogyo Kabushiki Kaisha: *See*—
Watanabe, Hiroshi, 4,455,774, Cl. 40-451.000.
G. Siempelkamp GmbH & Co.: *See*—
Pesch, Jurgen, 4,456,120, Cl. 198-648.000.
GA Technologies Inc.: *See*—
Judy, Murray S., 4,456,943, Cl. 361-160.000.
Gahle, Hans-Jurgen, to ITT Industries, Inc. Method of fabricating an integrated planar transistor. 4,456,488, Cl. 148-1.500.
Gaiser, Robert F.; Lohraff, Larry G.; and Myers, Lawrence R., to Bendix Corporation, The. Master cylinder. 4,455,830, Cl. 60-562.000.
Gaiser, Robert F.; Lohraff, Larry G.; and Myers, Lawrence R., to Bendix Corporation, The. Master cylinder. 4,455,832, Cl. 60-581.000.
Galasso, Francis S.; and Brennan, John J., to United Technologies Corporation. Reaction sintered silicon carbide. 4,456,634, Cl. 427-228.000.
Galdun, Daniel J.: *See*—
Markley, Theodore J.; Galdun, Daniel J.; Clark, Charles E.; Henderson, Robert G.; and Jencen, Frank W., 4,456,315, Cl. 312-137.000.
Galis, Alex. Mine roof truss assembly and associated method. 4,456,405, Cl. 405-288.000.
Gallardo, Manuel: *See*—
Ribassin, Patrick; Gallardo, Manuel; and Bertin, Alain J. L., 4,456,185, Cl. 241-92.000.
Galletti, Pierre M.: *See*—
De Rossi, Danilo E.; Galletti, Pierre M.; and Dario, Paolo, 4,456,013, Cl. 128-675.000.
Gallo, Joseph S. Stem cleaner. 4,455,784, Cl. 47-1.00R.
Gallusser, David O.; MacAvoy, David W.; Punako, Stephen; and Frear, David L., to Bendix Corporation, The. Sealing ring for an electrical connector. 4,456,320, Cl. 339-94.00M.
Gamoh, Ryouji, to Tokyo Shibaura Denki Kabushiki Kaisha. Electronic watthour meter. 4,456,878, Cl. 324-142.000.
Gang-Nail Systems, Inc.: *See*—
Rionda, Carlos S.; and Palacio, Joaquim J., 4,455,805, Cl. 52-712.000.

Gannon, Charles R.: *See—*
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Wier, John P.; and Garrett, Robert A., 4,456,086, Cl. 180-11.000.
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Gaston County Dyeing Machine Company: *See—*
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Gaube, Johann: *See—*
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Gautreaux, Marcelian F., to Ethyl Corporation. Synthesis of sodium aluminum hydride. 4,456,584, Cl. 423-644.000.
Gavrilin, Vladimir: *See—*
Kretschmer, Horst; Fleischer, Klaus; Gohler, Peter; Schingnitz, Manfred; Berger, Friedrich; Jegorow, Aleksander; Fedotov, Vasilij; Gavrilin, Vladimir; Gudymov, Ernest; Semenov, Vladimir; Achmatov, Igol; Majdurov, Nikolaj; and Avraamov, Evgenij, 4,455,949, Cl. 110-263.000.
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Gebr. Pfeiffer AG: *See—*
Bacharach, Ottmar, 4,456,267, Cl. 277-30.000.
Gehring, Heinz, to Maschinenfabrik Gehring GmbH & Co., KG. Self-controlled honing machine. 4,455,789, Cl. 51-34.00J.
Gehring, Ken: *See—*
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Geiger, Reinold. Plugging device for a bottle, notably a scent bottle. 4,456,140, Cl. 215-364.000.
Gekle, Siegmar: *See—*
Wrulich, Herwig; Zitz, Alfred; Schetina, Otto; and Gekle, Siegmar, 4,456,306, Cl. 299-81.000.
Gelbart, Daniel, to MacDonald Dettwiler & Associates Ltd. Electronically tuneable light source. 4,456,338, Cl. 350-358.000.
Genentech, Inc.: *See—*
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Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,456,558, Cl. 260-413.000.
General Dynamics, Pomona Division: *See—*
Shook, Richard G., 4,455,917, Cl. 89-1.817.
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General Electric Company: *See—*
Abolins, Visvaldis; and Holub, Fred F., 4,456,720, Cl. 524-176.000.
Boyles, Robert L., 4,456,085, Cl. 177-256.000.
Buckley, Leo P., Jr.; Chausse, Burnette P.; Chen, Arthur C.; Russell, John N.; and Wong, Thomas Y., 4,455,820, Cl. 60-39.030.
Cunningham, Eldon R., 4,456,845, Cl. 310-90.000.
DiMassimo, Donald V.; and May, John B., 4,456,910, Cl. 340-784.000.
Evans, Dennis C.; Nicoll, Robert A.; and Gladden, Robert E., 4,456,427, Cl. 416-95.000.
Frischmann, Peter G., 4,456,898, Cl. 335-217.000.
Heinold, George H., 4,456,266, Cl. 277-24.000.
Jones, Philip N.; and Drinkard, Tye C., 4,456,321, Cl. 339-97.00R.
Kelly, Peter B., 4,456,253, Cl. 273-51.000.
Krasznai, Charles Z.; and Snyder, Paul V., 4,456,820, Cl. 219-398.000.
Liu, Ping Y.; and Rosenquist, Niles R., 4,456,725, Cl. 524-476.000.
McCarty, William V.; and Thiemann, Donald J., 4,456,425, Cl. 415-122.00R.
McMillan, Stephen L.; and Cureton, Robert R., 4,455,844, Cl. 68-18.00F.
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General Foods Limited: *See—*
Newman, Alec T.; Rhodes, David; and Edge, Brian A., 4,456,148, Cl. 221-132.000.
General Instrument Corp.: *See—*
Morley, Richard M.; Multani, Jagir S.; and Sandhu, J. S., 4,456,978, Cl. 365-184.000.
General Mills, Inc.: *See—*
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General Motors Corporation: *See—*
Bly, Kenneth B.; Ludecke, Otto A.; and Smith, Richard H., 4,455,823, Cl. 60-311.000.
Genetic Laboratories, Inc.: *See—*
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Gerdes GmbH & Co.: *See—*
Heling, Paul, 4,456,450, Cl. 425-376.00R.
Gerding, Charles C., to Jones & Laughlin Steel Corporation. Method and apparatus for aligning, supporting, and transporting hollow cylinders. 4,456,417, Cl. 414-22.000.
Gersho, Allen; and Lawrence, Victor B., to Bell Telephone Laboratories, Incorporated. Multidimensional channel coding. 4,457,004, Cl. 375-67.000.
Gerster, John F., to Minnesota Mining and Manufacturing Company. Substituted naphtho[ij]quinolizines. 4,456,606, Cl. 424-258.000.
Gevers, David E., to Talbert Manufacting, Inc. Hydraulic trailer steering system. 4,456,280, Cl. 280-444.000.
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Merten, Gerhard; Breuer, Oswald; Hesse, Norbert; and Steinkuhl, Bernd, 4,456,307, Cl. 299-93.000.
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Giacobbe, Thomas J.; Williams, Thomas N., Jr.; and Horn, James M., to Rhone-Poulenc, Inc. Solvent and catalyst recovery and recycle in the manufacture of phenoxybenzoic acid. 4,456,767, Cl. 562-414.000.
Gibbs, Lee H. Animal feeding apparatus. 4,455,967, Cl. 119-58.000.
Gibson, Shirley I.: *See—*
Christensen, Robert F., 4,455,895, Cl. 81-3.46R.
Giess, Herbert K.: *See—*
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Giger, Gerhard: *See—*
Regenass, Willy; Giger, Gerhard; Kuster, Kaspar; and Achermann, Heinz, 4,456,389, Cl. 374-31.000.
Gilbertson, Frederick L., to De Havilland Aircraft of Canada, Limited, The. Air intake system for engine. 4,456,458, Cl. 55-306.000.
Gilmore Valve Company: *See—*
Watson, Richard R., 4,456,028, Cl. 137-493.000.
Girmes-Werke AG: *See—*
Bruggemann, Werner; and Laus, Heinrich, 4,456,035, Cl. 139-398.000.
Gladden, Robert E.: *See—*
Evans, Dennis C.; Nicoll, Robert A.; and Gladden, Robert E., 4,456,427, Cl. 416-95.000.
Glantz, Jerome J.; and Doenges, Michael G., to Lamb-Weston, Inc. Process for making french fried potatoes. 4,456,624, Cl. 426-96.000.
Glasow, Kenneth E. High speed milling cutter. 4,456,408, Cl. 407-35.000.
Glass, Emmett F.: *See—*
Brelsford, John E.; and Glass, Emmett F., 4,455,922, Cl. 91-358.00A.
Gnagnetti, Romano. Rotary expansible chamber device with eccentric rotor assembly including a flexible band. 4,456,442, Cl. 418-153.000.
GNB Batteries Inc.: *See—*
Otto, Neil C.; Giess, Herbert K.; and Mainzer, Jeffrey W., 4,456,666, Cl. 429-245.000.
Rao, Purushothama; and Nelson, Wendy J., 4,456,579, Cl. 420-566.000.
Go, Ting S. L.: *See—*
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Gocho, Nagahiro, to Olympus Optical Company Limited. Process of delivering samples and reagents. 4,456,037, Cl. 141-1.000.
Godejahn, Gordon C., Jr., to Rockwell International Corporation. Process for and structure of high density VLSI circuits, having self-aligned gates and contacts for FET devices and conducting lines. 4,455,737, Cl. 29-571.000.
Goeddel, David V., to Genentech, Inc. Hybrid human leukocyte interferons. 4,456,748, Cl. 536-27.000.
Goel, Anil B.; and Grimm, Robert A., to Ashland Oil, Inc. Manufacture of aryl esters. 4,456,555, Cl. 260-410.000.
Goetz, Manfred. Ceramic stove. 4,455,993, Cl. 126-64.000.
Gohler, Peter: *See—*
Kretschmer, Horst; Fleischer, Klaus; Gohler, Peter; Schingnitz, Manfred; Berger, Friedrich; Jegorow, Aleksander; Fedotov, Vasilij; Gavrilin, Vladimir; Gudymov, Ernest; Semenov, Vladimir; Achmatov, Igol; Majdurov, Nikolaj; and Avraamov, Evgenij, 4,455,949, Cl. 110-263.000.
Goldammer, Georg; Mahrt, Gunter; and Dammig, Joachim, to Schubert & Salzer. Method for opening and mixing fiber bales. 4,455,714, Cl. 19-81.000.
Goldowsky, Michael P.; and Kolbinger, Herman J., to North American Philips Corporation. Optical position sensor. 4,456,378, Cl. 356-373.000.
Gomi, Yoshifumi; Matsuzawa, Masanao; Ikeda, Yoshito; and Morita, Yoshihisa, to Kabushiki Kaisha Suwa Seikosha & Epson Corporation. Wire dot printer. 4,456,393, Cl. 400-124.000.
Gongwer, Calvin A., to Bendix Corporation, The. Spherical underwater vehicle. 4,455,962, Cl. 114-312.000.
Goodyear Aerospace Corporation: *See—*
Suter, Charles A.; and Namsick, Raymond J., 4,456,496, Cl. 156-249.000.
Gordon, Eric M.: *See—*
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Gorog, Sandor: *See*—
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Goshi Kaisha Kanemitsu Doko Yosetsu-sho: *See*—
Kanemitsu, Yukio, 4,455,853, Cl. 72-84.000.

Gottstein, Emil, to Martin Stoll GmbH. Apparatus for stepwise adjustment of separation between two chair portions. 4,456,298, Cl. 297-353.000.

Goudarzi, Khosrow; and Maltos, Fernando I. Apparatus for longitudinal sectioning of stem type vegetables. 4,455,929, Cl. 99-637.000.

Gould, Jack: *See*—
Smith, Francis S.; and Gould, Jack, 4,456,575, Cl. 264-176.00F.

Gourdou, Pierre: *See*—
Jung, Jean; Gourdou, Pierre; and Jacob, Yvon, 4,455,965, Cl. 118-622.000.

Gourmel, Yves, to Pont-A-Mousson S.A. Apparatus for supporting and centering a die core in continuous tube casting. 4,456,053, Cl. 164-421.000.

Gozeling, Jacobus A.; de Boer, Sibbele; and Spiering, Abraham A., to Estel Hoogovens B.V. Blast furnace taphole drill. 4,456,083, Cl. 175-415.000.

Graber, Warren S.; and Someshwar, Ashok H., to Texas Instruments Incorporated. Data processing system having multiple buses. 4,456,965, Cl. 364-900.000.

Graf, Richard: *See*—
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Graham, Emmette V., *Jr.*: *See*—
Wertz, Keith; and Graham, Emmette V., *Jr.*, 4,456,158, Cl. 224-316.000.

Graham, John W., to Swiss-Tex Incorporated. Cleaning device. 4,455,705, Cl. 15-121.000.

Granger, Donald W.: *See*—
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Heyne, Carl J.; and Hackworth, Donald T., 4,456,843, Cl. 310-68.00D.

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Hashimoto, Yoshitaka, to Sony Corporation. Method and apparatus for recording and reproducing a digital information signal. 4,456,930, Cl. 358-328.000.
Haskins, Steve W., to International Telephone and Telegraph Corporation. Switch construction for telephone instrument. 4,456,799, Cl. 200-5.00R.
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Havner, Charles W.; and Havner, Roger R., 4,455,904, Cl. 83-375.000.
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Hayashi, Mineo, to Nippon Electric Co., Ltd. Semiconductor memory device. 4,456,977, Cl. 365-51.000.
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Hayashi, Tsutomu; Kato, Masaie; and Saito, Mitsuru, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic pump and anti-skid brake system. 4,456,310, Cl. 303-10.000.
Hayden, Rodney, to TRW Canada Limited. Low cost relay. 4,456,896, Cl. 335-203.000.
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Hayes, Thomas A., Jr., to Xerox Corporation. Charge control system. 4,456,370, Cl. 355-14.0CH.
Haymaker, James R., to AT&T Technologies, Inc. Frequency counter. 4,456,876, Cl. 324-77.00R.
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Heling, Paul, to Gerdes GmbH & Co. Manual extruder for shaping pasta or similar products. 4,456,450, Cl. 425-376.00R.
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Kienholz, John C., 4,455,814, Cl. 56-126.000.
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Lorenz, Gordon; and Gehring, Ken, 4,456,536, Cl. 210-776.000.
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Richter, Roland; Hettel, Hans; and Muller, Hanns P., 4,456,709, Cl. 521-160.000.
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Heyne, Carl J.; and Hackworth, Donald T., to Westinghouse Electric Corp. Brushless dynamoelectric machine with improved control wheel assembly. 4,456,843, Cl. 310-68.00D.
Hicks, James D., Jr. Safety kit. 4,456,126, Cl. 206-573.000.
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; and Sugihara, Taisuke, to Asahi Kasei Kogyo Kabushiki Kaisha; and Hidaka, Hiroyoshi. Isoquinolinesulfonyl derivatives and process for the preparation thereof. 4,456,757, Cl. 546-139.000.
Higdon, Dennis W.: *See*—
Speckhart, Frank H.; and Higdon, Dennis W., 4,456,383, Cl. 368-9.000.
Hille, Lothar; Ludke, Heimo; and Hansjosten, Nikolaus, to Bayer Aktiengesellschaft. Process for the production of fiber-containing polyurethane moldings having inhomogeneously colored surfaces. 4,456,707, Cl. 521-99.000.
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Hira, Takashi, to Kubota, Ltd. Walk-behind type work vehicle. 4,455,813, Cl. 56-11.800.
Hirabayashi, Tsugio, to Konishiroku Photo Industry Co., Ltd. Paper feeding arrangement for copying apparatus. 4,456,363, Cl. 355-3.00R.
Hiraga, Masaharu; and Sakamoto, Seiichi, to Sanden Corporation. Scroll type fluid displacement apparatus. 4,456,435, Cl. 417-302.000.
Hirai, Shigeo; Sueyoshi, Toshinobu; and Amemiya, Masahiro, to Hitachi Maxell, Ltd. Process for preparing ferromagnetic particles comprising metallic iron. 4,456,475, Cl. 75-0.5AA.
Hirakata, Kaoru: *See*—
Murakami, Katsuyuki; Hirakata, Kaoru; Ishizaka, Fumio; Shimoda, Shinichi; and Itai, Reiichi, 4,456,510, Cl. 204-101.000.
Hiramatsu, Akira; and Yamamichi, Masayoshi, to Canon Kabushiki Kaisha. Focus detecting device. 4,456,351, Cl. 354-402.000.
Hirano, Toshinori; and Murase, Masakazu, to Terumo Corporation. Period measurement system. 4,456,959, Cl. 364-417.000.
Hiraoka Kogyo Kabushiki Kaisha: *See*—
Nasu, Hiroshi, 4,455,951, Cl. 112-84.000.
Hirata, Noritsugu; Okajima, Hidekazu; Takigawa, Tomoshi; Ichiyanagi, Toshikazu; and Takimoto, Hiroyuki, to Canon Kabushiki Kaisha. Cinematographic camera. 4,456,349, Cl. 352-91.00C.
Hirata, Takeyuki: *See*—
Masuda, Seiichi; Matsuo, Tohru; Ohkita, Yoshimichi; Aoki, Takeo; Nakajima, Hidemasa; Okamura, Shozo; Hirata, Takeyuki; and Anezaki, Shoji, 4,456,477, Cl. 75-51.000.
Hirata, Yasuo: *See*—
Nakagome, Yukio; Ogawa, Akira; Hirata, Yasuo; and Takahashi, Toshio, 4,456,988, Cl. 370-75.000.
Hirayama, Takeshi: *See*—
Sasayama, Takao; Amano, Matsuo; Hirayama, Takeshi; Sakamoto, Shinichi; and Miki, Masayuki, 4,455,980, Cl. 123-425.000.
Hisajima, Masahiko: *See*—
Shigemura, Yutaka; Hisajima, Masahiko; Kimura, Hiroshi; Yada, Isao; Irie, Yoichiro; Morimoto, Kiyoshi; and Nagashima, Takashi, 4,456,673, Cl. 430-125.000.
Hisatake, Michio: *See*—
Watanabe, Kazuo; Makabe, Hachiro; Orii, Akira; Hisatake, Michio; and Yamamoto, Kazuji, 4,456,859, Cl. 318-313.000.
Hishinuma, Yukio: *See*—
Akimoto, Hidetoshi; Kaji, Ryuichi; Komuro, Takeo; Muranaka, Yasushi; Kikuchi, Hideo; Hishinuma, Yukio; Nakajima, Fumito; and Terada, Hiroshi, 4,456,528, Cl. 209-49.000.
Hitachi Cable Ltd.: *See*—
Sugimoto, Yasuo; Maeda, Masami; Ishimura, Hiroshi; Saito, Satoshi; and Chinone, Koichi, 4,455,818, Cl. 57-293.000.
Hitachi, Ltd.: *See*—
Akimoto, Hidetoshi; Kaji, Ryuichi; Komuro, Takeo; Muranaka, Yasushi; Kikuchi, Hideo; Hishinuma, Yukio; Nakajima, Fumito; and Terada, Hiroshi, 4,456,528, Cl. 209-49.000.
Aoki, Masakazu; Ando, Haruhisa; Ohba, Shinya; and Takemoto, Iwao, 4,456,929, Cl. 358-213.000.
Atago, Takeshi; and Manaka, Toshio, 4,455,978, Cl. 123-339.000.
Kagohata, Tsuneo, 4,456,166, Cl. 236-13.000.
Matsuda, Yasuo; Honda, Kazuo; Fukui, Hiroshi; Amano, Hisao; and Musha, Shuji, 4,456,836, Cl. 307-252.00C.
Nakagawa, Isao; Kondo, Kazuo; and Kudo, Mitsuru, 4,456,885, Cl. 330-107.000.
Onogi, Tsuyoshi; Ueoka, Tetsuya; Suzuki, Nobuo; Oohara, Yoshihito; and Onozuka, Toshiaki, 4,457,017, Cl. 382-65.000.
Sasayama, Takao; Amano, Matsuo; Hirayama, Takeshi; Sakamoto, Shinichi; and Miki, Masayuki, 4,455,980, Cl. 123-425.000.
Sudo, Ryoichi; Miwa, Hiroaki; and Watanabe, Takeshi, 4,456,659, Cl. 428-447.000.
Suzuki, Ryo; Kodama, Naoki; Ikeda, Tadashi; and Sugita, Yutaka, 4,456,975, Cl. 365-36.000.
Yanagita, Tomoatsu; and Nagafuji, Motonobu, 4,456,955, Cl. 364-200.000.
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Hirai, Shigeo; Sueyoshi, Toshinobu; and Amemiya, Masahiro, 4,456,475, Cl. 75-0.5AA.
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Yoshikawa, Tadao; and Nishida, Shoji, 4,456,304, Cl. 299-33.000.
Yoshikawa, Tadao, 4,456,305, Cl. 299-33.000.

Hitchcock, Wilbur A.: *See*—
Fowler, Joe R.; Hitchcock, Wilbur A.; and Miller, Jack E., 4,456,073, Cl. 166-367.000.

Hjortendal, Royne G.: *See*—
Hammerberg, Lars E.; Hjortendal, Royne G.; and Ghisler, Walter, 4,456,940, Cl. 361-56.000.

Hobbs, Sharon S.: *See*—
Herzik, Aubrey M.; Hobbs, Sharon S.; and Repass, James T., 4,456,969, Cl. 364-900.000.

Hodson, Baden L., to Milba Properties Pty. Ltd. Levelling device for ladders. 4,456,095, Cl. 182-200.000.

Hoechst Aktiengesellschaft: *See*—
Engelmann, Manfred; Klippert, Heinz; and Tzschoppe, Eberhard, 4,456,735, Cl. 525-317.000.
Luders, Walter; and Burg, Karlheinz, 4,456,710, Cl. 523-200.000.
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Hoffarth, Gunther: *See*—
Walz, Klaus; Schafer, Karl; Hoffarth, Gunther; and Schulze, Hans, 4,456,554, Cl. 260-403.000.

Hoffmann, Gerhard: *See*—
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Hoffmann-La Roche Inc.: *See*—
Hofheinz, Werner; and Stohler, Harro, 4,456,610, Cl. 424-273.00R.

Hofheinz, Werner; and Stohler, Harro, to Hoffmann-La Roche Inc. Filaricidal 2-nitroimidazoles. 4,456,610, Cl. 424-273.00R.

Hohberger, Clive P.: *See*—
Vcelka, John L.; Pisik, Jay J.; and Hohberger, Clive P., 4,456,009, Cl. 604-152.000.

Hohmann, Volker: *See*—
Pietsch, Hanns; Hohmann, Volker; and Eckloff, Willi, 4,456,711, Cl. 523-206.000.

Holbert, Don R. Stabilizer method and apparatus for earth-boring operations. 4,456,080, Cl. 175-61.000.

Holce, Thomas J.; and Huckins, Charles M., to Sentrol, Inc. Plunger-operated switch unit. 4,456,897, Cl. 335-205.000.

Holladay, Jim L.: *See*—
Gwaltney, Robert E.; and Holladay, Jim L., 4,456,038, Cl. 141-95.000.

Holland, John P., to Allen-Bradley Company. Planar contact array switch having improved ground path for dissipating electrostatic discharges. 4,456,800, Cl. 200-5.00A.

Holly, Sandor: *See*—
Toth, Jozsef; Hajos, Gyorgy; Fekete, Gyorgy; Horvath, Istvan; Szporny, Laszlo ; Boor nee Mezei, Anna; Aranyi, Peter; Naray, Aniko; Gorog, Sandor; Holly, Sandor; and Molnar, Csaba, 4,456,601, Cl. 424-241.000.

Holman, Daniel G.; and Beisang, Arthur A., to Genetic Laboratories, Inc. Preparation of animal tissues for surgical implantation in human recipients. 4,456,589, Cl. 424-95.000.

Holmes, David W. J.: *See*—
Groves, Ian S.; Guard, David R.; Bunting, John G.; Rowlands, Christopher E.; Powter, Edwin J.; Holmes, David W. J.; and Trott, Graham J., 4,456,789, Cl. 179-18.0BC.

Holmes, Freddy. Wrench structure. 4,455,896, Cl. 81-57.260.

Holub, Fred F.: *See*—
Abolins, Vinvaldis; and Holub, Fred F., 4,456,720, Cl. 524-176.000.

Holubka, Joseph W.; and Dickie, Ray A., to Ford Motor Company. Coating composition comprising chain-extendable crosslinkable polyol and diblocked diisocyanate diurethane oligomer. 4,456,738, Cl. 525-454.000.

Holubka, Joseph W.; and Dickie, Ray A., to Ford Motor Company. Coating composition comprising chain-extendable crosslinkable polyol and diblocked diisocyanate diurea oligomer. 4,456,739, Cl. 525-510.000.

Holubka, Joseph W.; and Dickie, Ray A., to Ford Motor Company. Coating composition comprising chain-extendable crosslinkable polyol and diblocked diisocyanate diurethane oligomer. 4,456,740, Cl. 525-528.000.

Holzle, Gerd; Reinert, Gerhard; and Polony, Rudolf, to Ciba-Geigy Corporation. Process for bleaching textiles and for combating micro-organisms with sulphonated phthalocyanine carrying halogen or pseudohalogen substituents as photoactivator. 4,456,452, Cl. 8-103.000.

Homecrest Industries Incorporated: *See*—
Apissomian, Arthur A., 4,456,301, Cl. 297-445.000.

Homolik, Matthew W. Woodburning heating stove and heat extractor. 4,455,994, Cl. 126-123.000.

Homolik, Matthew W. Heating stove with heat regulating system. 4,455,995, Cl. 126-123.000.

Homsy, Charles A. Structure for in vivo implanation. 4,455,690, Cl. 3-1.000.

Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hayashi, Tsutomu; Kato, Masaie; and Saito, Mitsuru, 4,456,310, Cl. 303-10.000.
Kawaguchi, Takeshi, 4,456,099, Cl. 188-71.600.
Kume, Tadashi, 4,455,975, Cl. 123-52.0MV.
Tsuruta, Kiyofumi; Osanai, Yoshimi; and Onda, Takanori, 4,455,884, Cl. 74-477.000.
Yamamoto, Sadashi; Kayama, Hiroaki; and Watanabe, Masaki, 4,456,101, Cl. 188-196.0BA.
Yoshioka, Teruo; Naito, Shiro; Abe, Yuzo; and Uchida, Kuninobu, 4,455,734, Cl. 29-434.000.

Honda, Kazuo: *See*—
Matsuda, Yasuo; Honda, Kazuo; Fukui, Hiroshi; Amano, Hisao; and Musha, Shuji, 4,456,836, Cl. 307-252.00C.

Honda, Makoto: *See*—
Katsumata, Tsutomu; Dozono, Tetsuro; and Honda, Makoto, 4,456,563, Cl. 260-465.80R.

Honda, Zenzo: *See*—
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Honeywell Information Systems Inc.: *See*—
Lee, E. Paul; McCormick, Frederick H.; Vietmeier, Dennis P.; Harrington, Neal C.; and Clothier, Donald R., 4,456,972, Cl. 364-900.000.
Mohrman, Edward A.; Umeno, Tsunetaka; and Sato, Fumitaka, 4,456,952, Cl. 364-200.000.

Honig, Milton L.; and Weil, Edward D., to Stauffer Chemical Company. Process for preparing amides of methylphosphonates. 4,456,566, Cl. 260-984.000.

Honjo, Masahiro; and Tomita, Masao, to Matsushita Electric Industrial Co., Ltd. Horizontal skew elimination system for a VTR. 4,456,932, Cl. 360-36.100.

Hoover, Brian L. FM Broadcast band demodulator/stereo decoder. 4,457,011, Cl. 381-2.000.

Horeschi, Giancarlo: *See*—
Barozzi, Gian P.; and Horeschi, Giancarlo, 4,456,395, Cl. 400-559.100.

Hori, Fumihisa, to Alps Electric Co., Ltd. Printer system with alternate type belt and print hammer power control. 4,455,936, Cl. 101-93.140.

Hori, Haruo: *See*—
Hosooka, Shuuichi; and Hori, Haruo, 4,455,800, Cl. 52-309.100.

Hori, Yutaka: *See*—
Konishi, Toshiharu; Honda, Zenzo; Hori, Yutaka; Shimizu, Yukio; and Okada, Hideyuki, 4,456,652, Cl. 428-344.000.

Horiba, Ltd.: *See*—
Tomita, Katsuhiko; Shimizu, Tetsuo; and Bandoh, Masaichi, 4,456,919, Cl. 357-28.00A.
Yamada, Takeshi; Ohashi, Hideki; and Tanimoto, Masahiro, 4,456,580, Cl. 422-63.000.

Horn, James M.: *See*—
Giacobbe, Thomas J.; Williams, Thomas N., Jr.; and Horn, James M., 4,456,767, Cl. 562-414.000.

Hornbaker, Edwin D., to Ethyl Corporation. Thermoplastic polyblend compositions. 4,456,733, Cl. 525-71.000.

Horner, Patrick J., to Imperial Chemical Industries PLC. Polyester containing residues of a 1-hydroxy-3-6-bis(hydroxy-alkoxy)xanth-9-one, process for preparing same and shaped articles thereof. 4,456,746, Cl. 528-128.000.

Horton Industries, Inc.: *See*—
Hanks, James V.; and Dayen, Leonid, 4,456,110, Cl. 192-82.00T.

Horvath, Agnes: *See*—
Hermecz, Istvan; Breining, Tibor; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Kokosi, Jozsef, 4,456,752, Cl. 544-116.000.

Horvath, Istvan: *See*—
Toth, Jozsef; Hajos, Gyorgy; Fekete, Gyorgy; Horvath, Istvan; Szporny, Laszlo ; Boor nee Mezei, Anna; Aranyi, Peter; Naray, Aniko; Gorog, Sandor; Holly, Sandor; and Molnar, Csaba, 4,456,601, Cl. 424-241.000.

Horwath, Robert O.: *See*—
Maselli, John A.; and Horwath, Robert O., 4,456,622, Cl. 426-17.000.

Hosiden Electronics Co., Ltd.: *See*—
Nakagawa, Sadayoshi; and Shinohara, Mitsuharu, 4,456,796, Cl. 179-111.00E.

Hosono, Nagao: *See*—
Isaka, Kazuo; Hosono, Nagao; and Takahashi, Tohru, 4,456,368, Cl. 355-3.0FU.

Hosooka, Shuuichi; and Hori, Haruo, to Yoshida Kogyo K.K. Thermally insulating sash frame member. 4,455,800, Cl. 52-309.100.

Hostetter, John L. Weeding auger with U-shaped blade. 4,456,075, Cl. 172-25.000.

Houdaille Industries, Inc.: *See*—
Kern, Leon O.; Zeilinger, James G.; and Mueller, Gerald E., 4,456,271, Cl. 279-91.000.

Houston Industries: *See*—
Roach, Alva B., Jr., 4,456,906, Cl. 340-516.000.

Houston, Theodore W.; Tasch, Al F., Jr.; Darley, Henry M.; and Fu, Horng S., to Texas Instruments Incorporated. Self-aligned gate method for making MESFET semiconductor. 4,455,738, Cl. 29-571.000.

Houtz, Kenneth E., to Dresser Industries, Inc. Hydraulic brake control and valve therefor. 4,456,311, Cl. 303-10.000.

Howe, Charles B.: *See*—
Evans, Hawley R.; and Howe, Charles B., 4,455,997, Cl. 126-367.000.

Howe, Rodney C.: *See*—
Wilkinson, Harold C.; Gum, Charles E.; Howe, Rodney C.; Macinskas, Dean P.; Pease, Charles C.; Raycher, Robert J.; Rosen, Ronald; and Williams, Francis J., 4,456,808, Cl. 219-98.000.

Hsiao, Chin-Wen. Folding roaster. 4,455,992, Cl. 126-9.00R.

Huckins, Charles M.: *See*—
Holce, Thomas J.; and Huckins, Charles M., 4,456,897, Cl. 335-205.000.

Hudson, Anthony J.: *See*—
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Hudson's Bay Oil and Gas Company Limited: *See*—
Lorenz, Gordon; and Gehring, Ken, 4,456,536, Cl. 210-776.000.

Huebler, James E.; and Craig, Jeffrey M., to Consolidated Natural Gas Service Company. Sonic detection of gas leaks in underground pipes. 4,455,863, Cl. 73-40.50A.
Hughes Aircraft Company: *See*—
Arns, James A.; Edwards, Timothy J.; Moss, Gaylord E.; and Wreede, John E., 4,456,328, Cl. 350-3.600.
Carter, F. Anthony; and Sacks, Jacob M., 4,456,968, Cl. 364-900.000.
Hughes Tool Company: *See*—
Watkins, Bruce J., 4,456,070, Cl. 166-345.000.
Huignard, Jean P.; and Malard, Marcel, to Thomson-CSF. Extensive field camera. 4,456,327, Cl. 350-3.600.
Hukuhara, Seiichi, to Sanden Corporation. Scroll manufacturing method. 4,456,051, Cl. 164-131.000.
Hulbert, Matthew H.: *See*—
Leslie, John F.; Greasham, Randolph L.; and Hulbert, Matthew H., 4,456,532, Cl. 210-602.000.
Hung, Sheng-Hu. Locking device of a combination lock. 4,455,847, Cl. 70-284.000.
Hunter Douglas International N.V.: *See*—
Vecchiarelli, Francis, 4,456,049, Cl. 160-176.00R.
Hunzeker, James G.: *See*—
Baasch, Holger J.; Bishop, Ross W.; Charlson, Paul M.; Hunzeker, James G.; and Schwieters, Clarence R., 4,456,938, Cl. 360-109.000.
Huttunen, Jouko: *See*—
Mandell, Leo; Eklund, Vidar; Ekman, Kurt; Huttunen, Jouko; and Turunen, Olli, 4,456,749, Cl. 536-30.000.
Hydril Company: *See*—
Roche, Joseph R.; Alexander, Gabriel G.; and Tippit, Larry J., 4,456,062, Cl. 166-84.000.
Roche, Joseph R., 4,456,063, Cl. 166-84.000.
Hydro-Quebec: *See*—
Chenier, Andre, 4,456,875, Cl. 324-55.000.
Hynecek, Jaroslav, to Texas Instruments Incorporated. Process protection for individual device gates on large area MIS devices. 4,455,739, Cl. 29-571.000.
Ibata, Sachiko, to Nippon Tenshashi Kabushiki Kaisha. Method of manufacturing a polisher. 4,456,500, Cl. 156-634.000.
Ichihara, Yutaka: *See*—
Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; Miyaji, Akira; and Mizunoe, Katsumi, 4,456,931, Cl. 358-335.000.
Ichiyanagi, Toshikazu: *See*—
Hirata, Noritsugu; Okajima, Hidekazu; Takigawa, Tomoshi; Ichiyanagi, Toshikazu; and Takimoto, Hiroyuki, 4,456,349, Cl. 352-91.00C.
ICI Australia Limited: *See*—
Alexander, Roger D.; and Bates, Andrew J., 4,456,492, Cl. 149-8.000.
Ide, Tetsuo; and Iwamoto, Hiromu, to Fujitsu Limited. Comparator circuit. 4,456,840, Cl. 307-362.000.
Idzik, Joseph J.; Kouse, Charles H.; and Herzog, James L., to Elliott Turbomachinery Company, Inc. Tube cutter. 4,455,746, Cl. 30-106.000.
Iesaka, Susumu, to Tokyo Shibaura Denki Kabushiki Kaisha. Semiconductor device. 4,456,920, Cl. 357-46.000.
Iftikar, Syed H.; and Reeck, David L., to Seagate Technology. Head positioning assembly for disc apparatus. 4,456,937, Cl. 360-106.000.
Igarashi, Kazunobu. Electronic alarm wrist watch. 4,456,387, Cl. 368-230.000.
Igarashi, Toshiji: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,456,603, Cl. 424-248.570.
IHC Holland N. V.: *See*—
in't Hout, Henk H.; and Loevendie, Rudolf H., 4,456,119, Cl. 198-535.000.
Ihlein, Walter: *See*—
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Ikeda, Tadashi: *See*—
Suzuki, Ryo; Kodama, Naoki; Ikeda, Tadashi; and Sugita, Yutaka, 4,456,975, Cl. 365-36.000.
Ikeda, Yoshito: *See*—
Gomi, Yoshifumi; Matsuzawa, Masanao; Ikeda, Yoshito; and Morita, Yoshihisa, 4,456,393, Cl. 400-124.000.
Ikemori, Keiji, to Canon Kabushiki Kaisha. Optical system for focal length conversion. 4,456,340, Cl. 350-422.000.
Illinois Tool Works Inc.: *See*—
Wyckoff, Stephen G., 4,456,211, Cl. 248-544.000.
Ilmer, Andreas: *See*—
Schoettle, Klaus; Ilmer, Andreas; and Flohr, Joachim, 4,456,160, Cl. 226-195.000.
Imada, Kiyoshi: *See*—
Eguchi, Yoshitugu; Matsumoto, Osamu; and Imada, Kiyoshi, 4,456,572, Cl. 264-53.000.
Imai, Iwao: *See*—
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Imazeki, Ryoji; Yamazaki, Etsuo; and Sasaki, Takao, to Fanuc Ltd. Clamping tracer control system. 4,456,864, Cl. 318-578.000.
Imazeki, Ryoji; and Yamazaki, Etsuo, to Fujitsu Fanuc Limited. Tracer control system. 4,456,962, Cl. 364-520.000.
Imhof, Heinrich, to Ingenieurburo Imhof GmbH. Tank having a floating roof and seal. 4,456,144, Cl. 220-222.000.
Imperial Chemical Industries Limited: *See*—
Bloomfield, Allen A.; and Wilson, Frank R., 4,456,187, Cl. 242-18.0PW.
Smith, Francis S.; and Gould, Jack, 4,456,575, Cl. 264-176.00F.
Imperial Chemical Industries PLC: *See*—
Horner, Patrick J., 4,456,746, Cl. 528-128.000.
Inai, Yuichi: *See*—
Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,456,603, Cl. 424-248.570.
Inamori, Mikio: *See*—
Takenoya, Hideaki; Inamori, Mikio; and Shomura, Eiichi, 4,455,953, Cl. 112-262.100.
Incledon, Stephen H., to Pioneer Magnetics, Inc. Overlap control system for push-pull switching mode inverter power supply. 4,456,949, Cl. 363-26.000.
Indesit Industria Elettrodomestici Italiana S.p.A.: *See*—
Belisomi, Pietro, 4,457,021, Cl. 455-186.000.
Industeler: *See*—
Blanchot, Pierre, 4,456,091, Cl. 181-282.000.
Industra Products, Inc.: *See*—
Witwer, Keith A.; Moser, Keith W.; and Sanderson, Richard A., 4,455,743, Cl. 29-596.000.
Industrial Containers Pty. Ltd., Cnr. Moore: *See*—
Pamment, Noel G., 4,456,141, Cl. 220-1.00T.
Industrial Management Company: *See*—
Rooklyn, Jack, 4,456,944, Cl. 361-212.000.
Ing. C. Olivetti & C., S.p.A.: *See*—
De Simone, Pantaleo, 4,456,243, Cl. 271-245.000.
Simonotti, Lucio; and Ricca, Aldo, 4,456,234, Cl. 270-18.000.
Ing. Jurgen Volkmann, GmbH: *See*—
Volkmann, Jurgen; and Gross, Hans H., 4,455,706, Cl. 15-306.00A.
Ingenieurburo Imhof GmbH: *See*—
Imhof, Heinrich, 4,456,144, Cl. 220-222.000.
Inoue, Hideya: *See*—
Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; Miyaji, Akira; and Mizunoe, Katsumi, 4,456,931, Cl. 358-335.000.
Inoue, Junichi: *See*—
Yamada, Junzo; Mano, Tsuneo; and Inoue, Junichi, 4,456,980, Cl. 365-200.000.
Inoue, Kimio; Fukui, Tsugushi; Asai, Toshihiro; Nakagawa, Kazuhiko; and Kuriyama, Akimasa, to Kabushiki Kaisha Kobe Seiko Sho. Closed type mixing/kneading apparatus. 4,456,381, Cl. 366-97.000.
Inoue, Takayuki: *See*—
Fukumura, Mikio; Shibata, Hideo; Doi, Shuhei; Isaka, Tsutomu; and Inoue, Takayuki, 4,456,704, Cl. 521-79.000.
Inoue, Takeshi; and Miyasaka, Yoichi, to Nippon Electric Co., Ltd. Piezoelectric composite thin film resonator. 4,456,850, Cl. 310-324.000.
Inoue, Toshihide: *See*—
Yamamoto, Yoshiyuki; Inoue, Toshihide; and Yanagi, Masana, 4,456,719, Cl. 524-114.000.
Institut Elektrosvarki Imeni E. O. Patona: *See*—
Paton, Boris E.; Samilov, Vladimir N.; Ivaschenko, Grigory P.; Krasjukov, Alexandr V.; and Balitsky, Vladimir M., deceased, 4,455,852, Cl. 72-82.000.
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Travers, Christine; Trinh Dinh, Chan; Snappe, Roger; and Bournonville, Jean-Paul, 4,456,775, Cl. 568-885.000.
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Vogt, Peter, 4,455,871, Cl. 73-579.000.
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Anderson, Herbert R., Jr.; Araps, Constance J.; and Lotsko, Catherine A., 4,456,675, Cl. 430-256.000.
Baasch, Holger J.; Bishop, Ross W.; Charlson, Paul M.; Hunzeker, James G.; and Schwieters, Clarence R., 4,456,938, Cl. 360-109.000.
Bringol, Charles R.; and Kroeger, Wilbert L., III, 4,456,966, Cl. 364-900.000.
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Cann, George W.; Davis, Donald E.; and Trotter, Ralph R., 4,456,860, Cl. 318-561.000.
Carlgren, Richard G.; Rosenbaum, Walter S.; and Tannenbaum, Alan R., 4,456,973, Cl. 364-900.000.
Christie, Frederick R.; and Daley, Lawrence R., 4,456,712, Cl. 523-439.000.
Colglazier, Donald F.; and Kollar, Ernest P., 4,456,235, Cl. 271-3.100.
Crooks, Walter; Hafer, Cameron H.; and Weiche, William J., 4,456,915, Cl. 346-76.0PH.
Herzik, Aubrey M.; Hobbs, Sharon S.; and Repass, James T., 4,456,969, Cl. 364-900.000.
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Lin, Burn J., 4,456,371, Cl. 355-71.000.
Panissidi, Hugo A., 4,456,293, Cl. 294-106.000.
Ryan, Philip M., 4,456,995, Cl. 371-21.000.
Steen, Michael J.; and Zell, Michael N., 4,456,936, Cl. 360-104.000.

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Leslie, John F.; Greasham, Randolph L.; and Hulbert, Matthew H., 4,456,532, Cl. 210-602.000.
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Wheeler, Donald J.; Cooper, Christopher; and Krejsa, Charles R., 4,456,189, Cl. 242-55.000.
International Standard Electric Corporation: *See*—
Bludau, Wolfgang, 4,456,330, Cl. 350-96.180.
Spitza, Dieter, 4,456,997, Cl. 371-68.000.
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Chea, Ramon C. W., Jr.; Das, Santanu; Upp, Daniel C.; Cornu, Jozef; Danneels, Johan M. R.; and Taeymans, Jean R. J. M., 4,456,991, Cl. 370-58.000.
Haskins, Steve W., 4,456,799, Cl. 200-5.00R.
Wirsing, Howard L., 4,456,987, Cl. 370-58.000.
Interstate Electronics Corp.: *See*—
Finley, David R.; and Beck, Laurence A., 4,456,093, Cl. 182-2.000.
Inuzuka, Tsuneki: *See*—
Komiya, Yutaka; Murakami, Katsumi; Inuzuka, Tsuneki; and Sakamaki, Hisashi, 4,456,366, Cl. 355-8.000.
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Takada, Juichiro; Ueno, Shuichi; and Isamu, Kazuo, 4,456,196, Cl. 242-107.600.
Ise, Yukihiko: *See*—
Takayama, Ryoichi; Tokushima, Akira; Ueshiba, Nozomu; and Ise, Yukihiko, 4,456,849, Cl. 310-324.000.
Iseto Shiko Co., Ltd.: *See*—
Dallaserra, Arthur B., 4,455,809, Cl. 53-435.000.
Ishida, Kenichi, to Shigetoyo Yasui. Connecting structure of traction device for vehicle wheels. 4,456,047, Cl. 152-213.00A.
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Taniguchi, Shozo; Shinke, Osamu; Ishii, Masami; and Kubo, Shinichi, 4,456,993, Cl. 371-10.000.
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Ishikawa, Shozo: *See*—
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Ishikawa, Takatoshi; Mitsui, Akio; Morigaki, Masakazu; and Nakamura, Takashi, to Fuji Photo Film Co., Ltd. Silver halide color photographic material. 4,456,682, Cl. 430-523.000.
Ishikawa, Yasuki: *See*—
Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, 4,455,989, Cl. 123-620.000.
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Okumura, Yasushi; Okamura, Kazuhiko; Fugakawa, Yasuo; Ishikura, Tomoyuki; Kouno, Kageaki; and Lein, Joseph, 4,456,592, Cl. 424-177.000.
Ishimaru, Kenji: *See*—
Oshida, Jun-ichi; Nishikawa, Osamu; Tsuruta, Hideki; Takeshita, Toru; Yamamoto, Itaru; and Ishimaru, Kenji, 4,456,553, Cl. 260-397.200.
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Murakami, Katsuyuki; Hirakata, Kaoru; Ishizaka, Fumio; Shimoda, Shinichi; and Itai, Reiichi, 4,456,510, Cl. 204-101.000.
Isogai, Hideaki, to Fujitsu Limited. Static semiconductor memory device. 4,456,979, Cl. 365-190.000.
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Murakami, Katsuyuki; Hirakata, Kaoru; Ishizaka, Fumio; Shimoda, Shinichi; and Itai, Reiichi, 4,456,510, Cl. 204-101.000.
Italtractor I.T.M. S.p.A.: *See*—
Grilli, Walter; Crotti, Aldo; and Berselli, Orlando, 4,456,041, Cl. 141-329.000.
Ito, Hiroshi; and Kusumoto, Sinsuke, to Toyota Jidosha Kogyo Kabushiki Kaisha. Speed change control apparatus and method for automatic transmission. 4,456,107, Cl. 192-3.310.
Itoh, Akinori: *See*—
Miyata, Hiroyasu; Ohkita, Masao; Itoh, Akinori; and Minatodani, Shohji, 4,456,155, Cl. 222-396.000.
Itoh, Kunio: *See*—
Sugino, Takashi; Itoh, Kunio; Wada, Masaru; and Shimizu, Hirokazu, 4,456,999, Cl. 372-45.000.
ITT Industries, Inc.: *See*—
Gahle, Hans-Jurgen, 4,456,488, Cl. 148-1.500.
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Paton, Boris E.; Samilov, Vladimir N.; Ivaschenko, Grigory P.; Krasjukov, Alexandr V.; and Balitsky, Vladimir M., decessed, 4,455,852, Cl. 72-82.000.
Iwafune, Yasuo; and Kobayashi, Yuji, to Tokyo Kogaku Kikai Kabushiki Kaisha. Bearing means for angle measuring instruments. 4,455,758, Cl. 33-282.000.
Iwai, Hiroshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Method of manufacturing a self-aligned U-MOS semiconductor device. 4,455,740, Cl. 29-571.000.
Iwai, Shoichiro; and Kameda, Eiichi, to Nippon Mektron Ltd. Panel keyboard with irregular surfaced spacer. 4,456,798, Cl. 200-5.00A.
Iwakura, Sadao: *See*—
Nozaki, Mineo; Asakura, Osamu; Nagashima, Masasumi; and Iwakura, Sadao, 4,456,392, Cl. 400-120.000.
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Ide, Tetsuo; and Iwamoto, Hiromu, 4,456,840, Cl. 307-362.000.
Iyengar, Doreswamy R., to BASF Wyandotte Corporation. Process for the preparation of easily dispersible, high color strength, powdered alkali blue pigments. 4,456,485, Cl. 106-288.00Q.
J. M. Voith GmbH: *See*—
Suttinger, Richard; Bottger, Ernst; Henrich, Hans O.; Bahr, Theodor; and Thumm, Helmut, 4,456,182, Cl. 241-46.020.
J. Paaskesen og son a/s: *See*—
Paaskesen, Julius B., 4,455,926, Cl. 99-422.000.
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Barber, Lois M.; and Jackson, William H., 4,456,002, Cl. 128-77.000.
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Jung, Jean; Gourdou, Pierre; and Jacob, Yvon, 4,455,965, Cl. 118-622.000.
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Fraser, Howard H., Jr.; and Jacobs, John J., 4,456,941, Cl. 361-105.000.
Jacobs, Theresa M.: *See*—
Lyman, Joseph A., 4,455,970, Cl. 122-20.00B.
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Fritsche, Rainer; Jacoby, Hans-Dieter; and Schuster, Erich, 4,455,755, Cl. 33-174.00L.
Jagenberg AG: *See*—
Mohn, Hans-Werner, 4,456,114, Cl. 198-377.000.
Jagielski, David: *See*—
Frias, Ronald J.; and Jagielski, David, 4,456,201, Cl. 242-203.000.
Jakobi, Wilhelm, to Krupp-Koppers GmbH. Coking oven with horizontal chambers for producing coke. 4,456,505, Cl. 202-133.000.
Jamar, Walter. Apparatus for wall mounted presentation boards. 4,456,286, Cl. 281-15.00B.
James, Claude: *See*—
Aloup, Jean-Claude; Bouchaudon, Jean; Farge, Daniel; and James, Claude, 4,456,758, Cl. 546-284.000.
James, Larry R., to Allis-Chalmers Corp. Combine drive with double clutch assembly. 4,455,812, Cl. 56-11.500.
James, Rex I.: *See*—
Olander Jr., Emil E.; James, Rex I.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,456,964, Cl. 364-710.000.
Jan, Gerald: *See*—
Lenoir, John; and Jan, Gerald, 4,456,668, Cl. 430-17.000.
Janik, Stanley G.; and Rumford, Kimball J., to Avco Corporation. 101 Electronic fuel control ignition interlock. 4,455,821, Cl. 60-39.091.
Janome Sewing Machine Co., Ltd.: *See*—
Takenoya, Hideaki; Inamori, Mikio; and Shomura, Eiichi, 4,455,953, Cl. 112-262.100.
Watanabe, Kazuo; Makabe, Hachiro; Orii, Akira; Hisatake, Michio; and Yamamoto, Kazuji, 4,456,859, Cl. 318-313.000.
Janosi, Marcell, to Budapesti Radiotechnikai Gyar. Information recording apparatus with a disc loaded in a cassette. 4,456,935, Cl. 360-97.000.
Janssen, Joyce J.: *See*—
Christensen, Robert F., 4,455,895, Cl. 81-3.46R.
Janssen Pharmaceutica N.V.: *See*—
Heeres, Jan; and Hendrickx, Robert, 4,456,605, Cl. 424-250.000.
Janz, Joachim; and Henne, Helmut, to Gebr. Happich GmbH. Cushioning body for the interior of a vehicle, or the like. 4,456,644, Cl. 428-158.000.
Japan Bano'k Co., Ltd.: *See*—
Furutsu, Akira, 4,456,162, Cl. 227-67.000.
Japan Carlit Co., Ltd., The: *See*—
Murakami, Katsuyuki; Hirakata, Kaoru; Ishizaka, Fumio; Shimoda, Shinichi; and Itai, Reiichi, 4,456,510, Cl. 204-101.000.
Jarman, David J. Shear front feed system. 4,456,116, Cl. 198-414.000.
Jegorow, Aleksander: *See*—
Kretschmer, Horst; Fleischer, Klaus; Gohler, Peter; Schingnitz, Manfred; Berger, Friedrich; Jegorow, Aleksander; Fedotov, Vasilij; Gavrilin, Vladimir; Gudymov, Ernest; Semenov, Vladimir; Achmatov, Igol; Majdurov, Nikolaj; and Avraamov, Evgenij, 4,455,949, Cl. 110-263.000.
Jellins, Jack: *See*—
Kossoff, George; and Jellins, Jack, 4,455,872, Cl. 73-618.000.
Jencen, Frank W.: *See*—
Markley, Theodore J.; Galdun, Daniel J.; Clark, Charles E.; Henderson, Robert G.; and Jencen, Frank W., 4,456,315, Cl. 312-137.000.
Jenkins, John L.; Pierce, Larry L.; and Pierce, June S., to Picker International, Inc. Cassette-grid holding apparatus. 4,457,010, Cl. 378-167.000.
Jenkins, Robert H., Jr., to Texaco Inc. Mannich reaction product for motor fuels. 4,456,454, Cl. 44-73.000.
Jennings Pump Company: *See*—
Mannino, Vincent, 4,456,432, Cl. 417-2.000.

Jensen, William: *See*—
Lee, Kang I.; Jensen, William; and Cukor, Peter, 4,456,678, Cl. 430-279.000.
Jentoft, Arthur P.; and Couture, Paul A., to Wasco Products, Inc. Skylight construction. 4,455,799, Cl. 52-200.000.
Jentschmann, Erich. Accessory device for use on a sewing machine. 4,455,955, Cl. 112-274.000.
Johansen, Jan, to A/S Grorud Jernvarefabrik. Elongated window mounting member having a pivot point and a short slide rail section. 4,455,710, Cl. 16-221.000.
Johansson, Helen Frances: *See*—
Johansson, Sven O. G., 4,455,687, Cl. 2-424.000.
Johansson, Sven O. G., to Johansson, Helen Frances. Head cover and safety helmet. 4,455,687, Cl. 2-424.000.
Johnsen & Jorgensen (Plastics) Ltd.: *See*—
Davis, Eugene E.; and Burton, George W., 4,456,143, Cl. 220-214.000.
Johnson, Alfred O.; Rogness, Donald E.; and White, George W. Signal transformation apparatus. 4,456,989, Cl. 370-94.000.
Johnson, Archie L. Self-return mechanism for car wash hose boom swivel assembly. 4,456,177, Cl. 239-209.000.
Johnson Controls, Inc.: *See*—
Laakaniemi, Richard N.; and Wichman, Paul E., 4,456,168, Cl. 236-49.000.
Johnson, David E., to Mobil Oil Corporation. Process and apparatus for forming a composite foamed polymeric sheet structure having comparatively high density skin layers and a comparatively low density core layer. 4,456,571, Cl. 264-45.500.
Johnson & Johnson: *See*—
Langberg, Edwin, 4,456,374, Cl. 356-237.000.
Johnson, Robert E., to Pyrotector, Inc. Ionization type smoke detector with test circuit. 4,456,907, Cl. 340-629.000.
Johnson, Sam E. Shoulder protection device. 4,455,684, Cl. 2-2.000.
Joice-Cavanagh, Roland R., to Bishop-Wisecarver Corporation. Cargo bracing panel. 4,456,415, Cl. 410-129.000.
Jonckers, Kees: *See*—
Zuidam, Jan; van Nassau, Petrus J. M.; Bruls, Pierre G. M. B.; and Jonckers, Kees, 4,456,535, Cl. 210-750.000.
Jones, Adrian D. Socket wrench device. 4,455,897, Cl. 81-61.000.
Jones, Clarence O., Jr., to Niagara Machine & Tool Works. Overload control for mechanical power presses. 4,456,112, Cl. 192-150.000.
Jones, David A.: *See*—
Hegge, Robert A.; and Jones, David A., 4,455,692, Cl. 4-228.000.
Jones, David L.: *See*—
Price, Robert B.; and Jones, David L., 4,456,961, Cl. 364-513.000.
Jones, Dennis C.; and Marshall, James F., to United Technologies Corporation. Exhaust nozzle assembly with dual unison ring structure. 4,456,178, Cl. 239-265.390.
Jones, Gary A.; Bacon, David C.; and Pooley, Monte A., to Pertron Controls Corporation. Microprocessor-controlled controller for resistance welding machines. 4,456,809, Cl. 219-108.000.
Jones, Joseph K., to Cotton Incorporated. Method and apparatus for removing trash from material. 4,455,713, Cl. 19-80.00R.
Jones & Laughlin Steel Corporation: *See*—
Gerding, Charles C., 4,456,417, Cl. 414-22.000.
Jones, Philip N.; and Drinkard, Tye C., to General Electric Company. Two-piece, push-on type grounding clip. 4,456,321, Cl. 339-97.00R.
Jones, Stanley P.; and Gennard, Derek, to Emhart Industries, Inc. Control of individual section glassware forming machine. 4,456,462, Cl. 65-158.000.
Jorgensen, Jorgen A.; and Nygren, Donald W., to Northland Aluminum Products, Inc. Portable turntable for use in microwave ovens. 4,456,805, Cl. 219-10.55F.
Jorritsma, Johannes N. Method and apparatus for determining liquid flow rates. 4,455,870, Cl. 73-223.000.
Jost, Ernest M., to Chemet Corporation. Method of making silver powder. 4,456,473, Cl. 75-0.50A.
Jost, Ernest M., to Chemet Corporation. Method of making fine silver powder. 4,456,474, Cl. 75-0.50A.
Judy, Murray S., to GA Technologies Inc. Current sensing relay. 4,456,943, Cl. 361-160.000.
Juengst, Fredrick W., Jr.: *See*—
Dika, John A.; and Juengst, Fredrick W., Jr., 4,456,623, Cl. 426-69.000.
Jung, Jean; Gourdou, Pierre; and Jacob, Yvon, to Regie Nationale des Usines Renault. Automatic process and system for painting motor vehicle interiors. 4,455,965, Cl. 118-622.000.
Junichi, Kita; and Nagahara, Toshio, to Toyama Machine Works, Ltd. Control device for a balancing apparatus. 4,455,838, Cl. 60-711.000.
Junkert, Kenneth G.; and Voznick, Henry P., to Wahl Instruments, Inc. Noncontact temperature measuring device. 4,456,390, Cl. 374-128.000.
Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, Nippon Vaccine Co., Ltd.: *See*—
Shimizu, Takeshi, 4,456,588, Cl. 424-92.000.
K. J. Law Engineers, Inc.: *See*—
Fohey, Donald R., 4,456,829, Cl. 250-560.000.
K.R. Associates, Inc.: *See*—
Knowles, Albert H., 4,455,966, Cl. 119-3.000.
K. Shoemakers Limited: *See*—
Marris, Richard E. F., 4,455,702, Cl. 12-142.00R.
Kabushiki Kaisha Bandai: *See*—
Murakami, Katsushi, 4,456,384, Cl. 368-10.000.
Kabushiki Kaisha Daikin Seisakusho: *See*—
Manaki, Takayuki, 4,456,100, Cl. 188-77.00R.
Kabushiki Kaisha Kawai Gakki Seisakusho: *See*—
Tagaki, Shinji, 4,455,912, Cl. 84-177.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Inoue, Kimio; Fukui, Tsugushi; Asai, Toshihiro; Nakagawa, Kazuhiko; and Kuriyama, Akimasa, 4,456,381, Cl. 366-97.000.
Kawamura, Teruaki; Komatsu, Yukihiko; and Yamane, Hiroshi, 4,455,726, Cl. 29-33.00T.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Nishiki, Tetsuya; and Kamide, Takao, 4,456,088, Cl. 180-168.000.
Wakai, Hideyuki, 4,456,960, Cl. 364-474.000.
Kabushiki Kaisha Naka Gijutsu Kenkyusho: *See*—
Naka, Hiromitsu, 4,455,797, Cl. 52-179.000.
Kabushiki Kaisha Sanyo Seiki: *See*—
Hayashi, Masayuki, 4,455,855, Cl. 72-178.000.
Kabushiki Kaisha Suwa Seikosha & Epson Corporation: *See*—
Gomi, Yoshifumi; Matsuzawa, Masanao; Ikeda, Yoshito; and Morita, Yoshihisa, 4,456,393, Cl. 400-124.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
Suzuki, Yoshihisa; and Seiki, Kazuo, 4,455,819, Cl. 57-404.000.
Kabushiki Kaisha Vine: *See*—
Torii, Yoshihiko; and Tochikubo, Osamu, 4,455,882, Cl. 73-864.650.
Kadowaki, Takashi; and Onodera, Kaoru, to Konishiroku Photo Industry Co., Ltd. Color photographic materials. 4,456,681, Cl. 430-505.000.
Kageyama, Hayashi, to Fuji Jukogyo Kabushiki Kaisha. Control system for a four-wheel drive vehicle. 4,456,108, Cl. 192-4.00A.
Kagohata, Tsuneo, to Hitachi, Ltd. Temperature control system for air conditioners. 4,456,166, Cl. 236-13.000.
Kaim, John W.: *See*—
Altherr, Russell G.; and Kaim, John W., 4,456,133, Cl. 213-62.00R.
Kainmuller, Thomas: *See*—
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Kaji, Ryuichi: *See*—
Akimoto, Hidetoshi; Kaji, Ryuichi; Komuro, Takeo; Muranaka, Yasushi; Kikuchi, Hideo; Hishinuma, Yukio; Nakajima, Fumito; and Terada, Hiroshi, 4,456,528, Cl. 209-49.000.
Kajiyama, Ryuichi, to Mitsubishi Denki Kabushiki Kaisha. Terminal slowdown apparatus for elevator. 4,456,096, Cl. 187-29.00R.
Kalal, John D., to Schott International, Inc. Package and display system. 4,456,122, Cl. 206-45.340.
Kalaus, Gyorgy: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo , 4,456,607, Cl. 424-262.000.
Kalina, Davida W.: *See*—
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Kamatani, Yoshio; Tanaka, Michio; Yamazaki, Kyuya; and Nishino, Kenichi, to Takeda Chemical Industries, Ltd. Composition for producing polyurethane resin at ambient temperature. 4,456,744, Cl. 528-71.000.
Kameda, Eiichi: *See*—
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Kamei, Taketo: *See*—
Osada, Kimio; Hayashi, Motokazu; and Kamei, Taketo, 4,456,854, Cl. 315-58.000.
Kamer, Glenn E.: *See*—
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Kamide, Takao: *See*—
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Kamijyo, Yoshimi: *See*—
Kano, Mitsuru; Nakanowatari, Jun; and Kamijyo, Yoshimi, 4,456,549, Cl. 252-518.000.
Kamiya, Michihiko: *See*—
Yoshimi, Akiro; Kamiya, Michihiko; Kojima, Yasuhumi; Ootsuka, Fumio; and Matsushima, Takeo, 4,456,055, Cl. 165-12.000.
Kamiya, Shigeru: *See*—
Nozawa, Masaei; Kamiya, Shigeru; and Yoshida, Hitoshi, 4,456,457, Cl. 55-283.000.
Kampichler, Gunter, to Robert Bosch GmbH. Method for mounting at least one single-cylinder plug-in fuel injection pump on a diesel internal combustion engine. 4,455,868, Cl. 73-119.00A.
Kaneda, Fumio; and Maeike, Tadahiro, to Nippon Kokan Kabushiki Kaisha; and Nichiden Koshuha Kabushiki Kaisha. Method and apparatus for making an electric resistance welded tube. 4,456,803, Cl. 219-8.500.
Kanegae, Hidetoshi; Kawamura, Yoshihisa; Nakajima, Masao; and Yasuhara, Seishi, to Nissan Motor Company, Limited. Failsafe for an engine control. 4,456,831, Cl. 290-38.00R.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Miyashita, Shunitsu; Azuma, Masaaki; and Somemiya, Akiyoshi, 4,456,736, Cl. 525-392.000.
Kaneko, Takushi: *See*—
Schmitz, Henry; Kaneko, Takushi; Essery, John M.; and Doyle, Terrence W., 4,456,765, Cl. 549-332.000.
Kanemitsu, Yukio, to Goshi Kaisha Kanemitsu Doko Yosetsu-sho. Method of making poly-V pulleys. 4,455,853, Cl. 72-84.000.
Kano, Mitsuru; Nakanowatari, Jun; and Kamijyo, Yoshimi, to Alps Electric Co., Ltd. Paste for formation of transparent electroconductive coating film and process for preparation of said paste. 4,456,549, Cl. 252-518.000.
Kansai Paint Co. Ltd.: *See*—
Misawa, Masayuki; and Yago, Hidetaka, 4,456,514, Cl. 204-181.00C.

Kantor, Itzhak, to Plasson Maagan Michael Industries Ltd. Control device particularly useful as manual slide valve. 4,456,026, Cl. 137-315.000.

Karl Mengele & Sohne: *See*—
Reiff, Harro, 4,455,906, Cl. 83-438.000.

Karpati, Egon: *See*—
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Kato, Masatake, to Canon Kabushiki Kaisha. Zoom objective. 4,456,341, Cl. 350-427.000.

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Kato, Takazo: *See*—
Matsuda, Fujio; Kato, Takazo; and Kiyoura, Tadamitsu, 4,456,760, Cl. 548-508.000.

Kato, Yoshiaki: *See*—
Mizuno, Masanori; Kato, Yoshiaki; and Mizuno, Takaji, 4,456,813, Cl. 219-130.210.
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Wydeven, Theodore J.; and Katz, Moshe G., 4,456,708, Cl. 521-141.000.

Kauffman, Ivan L.; and Allen, Robert J., to Ex-Cell-O Corporation. Single to dual indexing carton transfer mechanism. 4,456,118, Cl. 198-480.000.

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Steffler, Jean C.; Kaufman, Herman; Porlier, Joseph A. G.; and Firth, James A., 4,455,685, Cl. 2-2.10A.

Kaufmann, Kenneth M.; Lundstrom, Robert W.; and Beer, Robert E., to Pako Corporation. Control apparatus for film disc processor. 4,456,355, Cl. 354-299.000.

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Yamamura, Sakae; and Kawada, Shigeki, 4,456,868, Cl. 318-800.000.

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Uchida, Shigeru; Watanabe, Kazuo; Ozawa, Kousaku; and Kawaharada, Minoru, 4,455,849, Cl. 72-41.000.

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Kawakami, Takashi, to Concast Holding AG. Apparatus for oscillating a continuous casting mold. 4,456,052, Cl. 164-416.000.

Kawakami, Yasushi, to Nissan Motor Company, Ltd. Cylinder block of an internal combustion engine. 4,455,972, Cl. 123-41.740.

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Wayman, Robert W.; Kawamoto, Mutsumi; and Sakakibara, Shiro, 4,455,888, Cl. 74-689.000.

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Murata, Minoru; and Kawanabe, Tsuyoshi, 4,455,937, Cl. 101-93.150.

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Kay, George; and Keskinen, Alan, to Vacco Industries. Perforated sheet stock flow restrictor. 4,456,033, Cl. 138-42.000.

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Kay, Robin M.: *See*—
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Kayama, Hiroaki: *See*—
Yamamoto, Sadashi; Kayama, Hiroaki; and Watanabe, Masaki, 4,456,101, Cl. 188-196.0BA.

Keable, Denis L. Expandable fishing lure. 4,455,780, Cl. 43-42.040.

Keddie, Burton G., to Hempe Manufacturing Company, Inc. Miter saw guides. 4,455,908, Cl. 83-767.000.

Keech, David A.: *See*—
Miner, David W.; Driscoll, Mark D.; Sorenson, John E.; Kirchner, Robert T.; and Keech, David A., 4,456,173, Cl. 237-67.000.

Keiper Recaro, Inc.: *See*—
Kluting, Bernd A.; and Zaveri, Vikram H., 4,456,300, Cl. 297-366.000.

Keith, Alec D., to Key Pharmaceuticals, Inc. Pheromone delivery system. 4,456,587, Cl. 424-78.000.

Keleher, Andrew G.: *See*—
Albanese, Vincent M.; and Keleher, Andrew G., 4,456,635, Cl. 427-230.000.

Kelland, Robert E. Wind turbine. 4,456,429, Cl. 416-117.000.

Keller, Joseph H.; and Baur, Fred G., to Met Pro Corporation. Abatement screen catalyst. 4,456,702, Cl. 502-314.000.

Keller, Reimund: *See*—
Schubert, Peter; Pfeifer, Hermann; Hermann, Volker; Keller, Reimund; and Schulz, Eckhard, 4,456,449, Cl. 425-253.000.

Kelly, H. Neale: *See*—
MacConochie, Ian O.; Lawson, Ashby G.; and Kelly, H. Neale, 4,456,208, Cl. 244-158.00A.

Kelly, Peter B., to General Electric Company. Hardboard-bonded melamine overlaid surface for bowling lane. 4,456,253, Cl. 273-51.000.

Kemmner, Ulrich: *See*—
Schillinger, Rainer; Ruhl, Karl; Kemmner, Ulrich; and Schuler, Hans, 4,456,436, Cl. 417-366.000.

Kenny, Charles H. Fracture holding. 4,456,004, Cl. 128-92.00A.

Kent, Henry R., to Maxwell Laboratories, Inc. Visible tamper-proof closure arrangement. 4,456,139, Cl. 215-252.000.

Kern, Leon O.; Zeilinger, James G.; and Mueller, Gerald E., to Houdaille Industries, Inc. Tool holder with clamped position latch. 4,456,271, Cl. 279-91.000.

Keskinen, Alan: *See*—
Kay, George; and Keskinen, Alan, 4,456,033, Cl. 138-42.000.

Kesten, Martin, to Preston Engravers, Inc. Adjustable anvil roll. 4,455,903, Cl. 83-346.000.

Ketre, Nicholas A.: *See*—
Osborne, William E.; and Ketre, Nicholas A., 4,455,919, Cl. 89-138.000.

Keve, Tibor: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo , 4,456,607, Cl. 424-262.000.

Key Pharmaceuticals, Inc.: *See*—
Keith, Alec D., 4,456,587, Cl. 424-78.000.

Keyes, Barry E. Thickness gauge. 4,455,753, Cl. 33-143.00E.

Keyes Fibre Company: *See*—
Foster, Peter D.; and Stowers, Clifford, 4,456,164, Cl. 229-43.000.

Kienhofer, Klaus, to Gebr. Felss. Swaging machine. 4,455,851, Cl. 72-76.000.

Kienholz, John C., to Her Majesty The Queen in right of Alberta as Represented by The Minister of Agriculture. Seed harvester. 4,455,814, Cl. 56-126.000.

Kijima, Shizumasa: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,456,558, Cl. 260-413.000.

Kikuchi, Hideo: *See*—
Akimoto, Hidetoshi; Kaji, Ryuichi; Komuro, Takeo; Muranaka, Yasushi; Kikuchi, Hideo; Hishinuma, Yukio; Nakajima, Fumito; and Terada, Hiroshi, 4,456,528, Cl. 209-49.000.

Kikuchi, Yoshiki; Ohmori, Takashi; Moriguchi, Haruhiko; and Nakajima, Hisao, to Fuji Xerox Co., Ltd. Copying machine. 4,456,824, Cl. 250-318.000.

Kimberley, John A.: *See*—
Bullis, Robert H.; Kimberley, John A.; and Couch, Robert P., 4,456,883, Cl. 324-464.000.

Kimura, Hiroshi: *See*—
Shigemura, Yutaka; Hisajima, Masahiko; Kimura, Hiroshi; Yada, Isao; Irie, Yoichiro; Morimoto, Kiyoshi; and Nagashima, Takashi, 4,456,673, Cl. 430-125.000.

Kinast, John A.: *See*—
Wurm, Jaroslav; and Kinast, John A., 4,455,841, Cl. 62-6.000.

by King, James R., to Rockwell International Corporation. Signal processing device for use on radio links. 4,457,020, Cl. 455-70.000.

Kircher, Klaus: *See*—
Eimers, Erich; Dhein, Rolf; and Kircher, Klaus, 4,456,717, Cl. 524-109.000.

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Miner, David W.; Driscoll, Mark D.; Sorenson, John E.; Kirchner, Robert T.; and Keech, David A., 4,456,173, Cl. 237-67.000.

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Kishi, Norimasa; Sasanuma, Kiyoshi; Takeuchi, Yasuhisa; and Kato, Shinichi, to Nissan Motor Company, Ltd. Optical signal transmission system for an automotive vehicle. 4,456,903, Cl. 340-54.000.

Kita, Toru, to Nissan Motor Co., Ltd. Fluid flow rate measuring apparatus. 4,455,878, Cl. 73-861.220.

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Matsui, Kazuhiro, 4,455,715, Cl. 24-16.0PB.

Kitasato Institute, The: *See*—
Kojima, Yasuhiko; Konno, Seishi; and Hashimoto, Takashi, 4,456,597, Cl. 424-195.000.
Kivel, Daniel M.; and Weber, Gerhard M., to Grow Group, Inc. Method of applying aqueous chip resistant coating compositions. 4,456,507, Cl. 204-181.00T.
Kiyoura, Tadamitsu: *See*—
Matsuda, Fujio; Kato, Takazo; and Kiyoura, Tadamitsu, 4,456,760, Cl. 548-508.000.
Kleeger, Douglas. Chuka stick systems. 4,456,256, Cl. 273-84.00R.
Klein, Gary S., to Eaton Corporation. Conduit sealing connector. 4,456,784, Cl. 174-23.00R.
Kleinewefers, Jaeggli Textilmaschinen AG: *See*—
Tschirner, Wolfgang, 4,455,727, Cl. 29-113.00R.
Kleinknecht, Hans P., to RCA Corporation. Method and apparatus for determining the doping profile in epitaxial layers of semiconductors. 4,456,879, Cl. 324-158.00D.
Klesse, Wolfgang: *See*—
Siol, Werner; Fink, Herbert; Klesse, Wolfgang; Rauch, Hubert; and Suetterlin, Norbert, 4,456,726, Cl. 524-501.000.
Klett, Robert J.: *See*—
Spars, Byron G.; Klett, Robert J.; and Wallman, P. Henrik, 4,456,525, Cl. 208-11.00R.
Klibbe, Arthur W.: *See*—
Haas, Lawrence J.; Klibbe, Arthur W.; and Perez-Mendez, Pedro I., 4,456,996, Cl. 371-37.000.
Kline, Samuel J.; and Little, Richard E., to GTE Business Communication Systems Inc. Telecommunication trunk circuit reporter and advisor. 4,456,788, Cl. 179-7.10R.
Kling, Guenter: *See*—
Wahr, Johannes; and Kling, Guenter, 4,455,785, Cl. 49-488.000.
Klinger, Roland W., to Bendix Corporation, The. Resonant flyback boost circuit. 4,456,856, Cl. 315-408.000.
Klippert, Heinz: *See*—
Engelmann, Manfred; Klippert, Heinz; and Tzschoppe, Eberhard, 4,456,735, Cl. 525-317.000.
Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Stadler, Hans; Bauer, Lothar; and Strusch, Wolfgang, 4,455,973, Cl. 123-41.760.
Klose, Sigmar: *See*—
Edelmann, Hermann; Pasch, Manfred; Klose, Sigmar; Haar, Hans-Peter; and Mann, Karlheinz, 4,456,581, Cl. 422-72.000.
Klushin, Valery A.: *See*—
Ermolovich, Vyacheslav I.; Klushin, Valery A.; Sadko, Vladimir I.; and Schukin, Valery Y., 4,455,854, Cl. 72-90.000.
Kluting, Bernd A.; and Zaveri, Vikram H., to Keiper Recaro, Inc. Seat back adjuster. 4,456,300, Cl. 297-366.000.
Knoedler, Roy E.; and Basey, Otis J., to Cosco, Inc. Juvenile seat with adjustable automatic locking barrier. 4,456,302, Cl. 297-488.000.
Knoos, Stellan, to AGA Aktiebolag, a part interest. Thermodynamic machine and method. 4,455,826, Cl. 60-526.000.
Knopf, Franz: *See*—
Kirchweger, Karl; and Knopf, Franz, 4,455,971, Cl. 123-41.700.
Knott, John, to EMI Limited. Spool mounting apparatus. 4,456,191, Cl. 242-68.100.
Knowles, Albert H., to K.R. Associates, Inc. Method of and apparatus for holding live fish and the like. 4,455,966, Cl. 119-3.000.
Kobayashi, Masateru: *See*—
Murakami, Masahiro; Kobayashi, Masateru; Yamamoto, Kimiyo; and Shibuya, Chisei, 4,456,754, Cl. 544-21.000.
Kobayashi, Takao: *See*—
Ogino, Yoshio; Kobayashi, Takao; Tsuda, Yuji; and Nishimura, Hitoshi, 4,456,807, Cl. 219-10.770.
Kobayashi, Yuji: *See*—
Iwafune, Yasuo; and Kobayashi, Yuji, 4,455,758, Cl. 33-282.000.
Kobzina, John W., to Chevron Research Company. Herbicidal N-haloacetyl-2-methyl-6-substituted methoxymethylanilines. 4,456,471, Cl. 71-118.000.
Koch, Eckhard: *See*—
Engel, Hinrich; Koch, Eckhard; and Vogg, Gunther, 4,456,207, Cl. 244-137.00R.
Kocot, Raymond H., to Burroughs Corporation. Ink jet cartridge with hydrostatic controller. 4,456,916, Cl. 346-140.00R.
Kodama, Naoki: *See*—
Suzuki, Ryo; Kodama, Naoki; Ikeda, Tadashi; and Sugita, Yutaka, 4,456,975, Cl. 365-36.000.
Kodera, Masao: *See*—
Yasuda, Eturo; Akita, Shigeyuki; and Kodera, Masao, 4,456,848, Cl. 310-322.000.
Koflach Sportgerate Gesellschaft m.b.H.: *See*—
Fritsch, Felix, 4,455,769, Cl. 36-121.000.
Kojima, Yasuhiko; Konno, Seishi; and Hashimoto, Takashi, to Kitasato Institute, The. Interferon inducer, a process for producing the same and pharmaceutical composition containing the same. 4,456,597, Cl. 424-195.000.
Kojima, Yasuhumi: *See*—
Yoshimi, Akiro; Kamiya, Michihiko; Kojima, Yasuhumi; Ootsuka, Fumio; and Matsushima, Takeo, 4,456,055, Cl. 165-12.000.
Kokosi, Jozsef: *See*—
Hermecz, Istvan; Breining, Tibor; Vasvari nee Debreczy, Lelle; Horvath, Agnes; and Kokosi, Jozsef, 4,456,752, Cl. 544-116.000.
Kokusai Denshin Denwa Kabushiki Kaisha: *See*—
Nakagome, Yukio; Ogawa, Akira; Hirata, Yasuo; and Takahashi, Toshio, 4,456,988, Cl. 370-75.000.
Tanaka, Fujio; Okamura, Yasuyuki; Kushiro, Yukitoshi; Ota, Chuichi; and Akiba, Shigeyuki, 4,456,998, Cl. 372-45.000.
Kolbinger, Herman J.: *See*—
Goldowsky, Michael P.; and Kolbinger, Herman J., 4,456,378, Cl. 356-373.000.
Kolivashko, Alexandr S.: *See*—
Mamrosov, Alexandr D.; Fedulov, Oleg V.; Kolivashko, Alexandr S.; Meniovich, Boris I.; and Neboga, Vladimir A., 4,456,175, Cl. 239-113.000.
Kollar, Ernest P.: *See*—
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Kollmorgen Technologies Corporation: *See*—
Wedman, Leonard N.; and Bourque, Joseph A., 4,456,934, Cl. 360-78.000.
Kollner, Hans J.: *See*—
Mehnert, Walter; Kollner, Hans J.; and Tonnes, Helmut, 4,456,817, Cl. 219-263.000.
Kolm, Eric A.: *See*—
Kolm, Henry H.; and Kolm, Eric A., 4,456,394, Cl. 400-124.000.
Kolm, Henry H.; and Kolm, Eric A., to Piezo Electric Products, Inc. Piezoelectric printer and asymmetric piezoelectric actuator used therein. 4,456,394, Cl. 400-124.000.
Kolodner, Paul R., to AT&T Bell Laboratories. Fabrication of solid state electronic devices using fluorescent imaging of surface temperature profiles. 4,455,741, Cl. 29-574.000.
Komatsu, Yukihiko: *See*—
Kawamura, Teruaki; Komatsu, Yukihiko; and Yamane, Hiroshi, 4,455,726, Cl. 29-33.00T.
Komine, Yoshiharu; and Sawada, Takao, to Mitsubishi Denki Kabushiki Kaisha. Gas and humidity sensing element. 4,456,902, Cl. 338-34.000.
Komiya, Yutaka; Murakami, Katsumi; Inuzuka, Tsuneki; and Sakamaki, Hisashi, to Canon Kabushiki Kaisha. Image forming process control. 4,456,366, Cl. 355-8.000.
Komuro, Takeo: *See*—
Akimoto, Hidetoshi; Kaji, Ryuichi; Komuro, Takeo; Muranaka, Yasushi; Kikuchi, Hideo; Hishinuma, Yukio; Nakajima, Fumito; and Terada, Hiroshi, 4,456,528, Cl. 209-49.000.
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Tanaka, Kentaro; Kondo, Eiji; Matsumoto, Kouichi; Shoji, Jun'ichi; and Tsuji, Naoki, 4,456,686, Cl. 435-119.000.
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Kondo, Takashi; Takagi, Kiyotaka; and Nishiyama, Taichiro, to Fujisawa Pharmaceutical Co., Ltd. Test system for identifying bacteria. 4,456,380, Cl. 356-418.000.
Konig, Helmut. Device for applying oil on dough portions. 4,456,446, Cl. 425-102.000.
Konishi, Toshiharu; Honda, Zenzo; Hori, Yutaka; Shimizu, Yukio; and Okada, Hideyuki, to Nitto Electric Industrial Co., Ltd. Electrically conductive adhesive tape. 4,456,652, Cl. 428-344.000.
Konishiroku Photo Industry Co., Ltd.: *See*—
Hirabayashi, Tsugio, 4,456,363, Cl. 355-3.00R.
Kadowaki, Takashi; and Onodera, Kaoru, 4,456,681, Cl. 430-505.000.
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Kojima, Yasuhiko; Konno, Seishi; and Hashimoto, Takashi, 4,456,597, Cl. 424-195.000.
Kono, Makoto: *See*—
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Koppers Company, Inc.: *See*—
Harju, Philip H.; and Pasek, Eugene A., 4,456,763, Cl. 549-249.000.
Kopsco, Michael A.: *See*—
Markow, Edward G.; and Kopsco, Michael A., 4,456,048, Cl. 152-330.0RF.
Koren, Erwin: *See*—
Eustacchio, Peter; and Koren, Erwin, 4,456,530, Cl. 210-396.000.
Kornberger, Otto, to MERO-Raumstruktur GmbH & Co. Wurzburg. Apparatus for sealing flat elements together, particularly roof elements. 4,455,803, Cl. 52-395.000.
Korner, Jorg P., to Uhde GmbH. Valve assembly for high-pressure pumps. 4,456,440, Cl. 417-540.000.
Kosch, Delmar D. Welding wire dispenser. 4,456,198, Cl. 242-156.200.
Kossoff, George; and Jellins, Jack, to Commonwealth of Australia, The Department of Health. Rotating ultrasonic scanner. 4,455,872, Cl. 73-618.000.
Kotian, Vijayraj M., to Eaton Corporation. Electrical cable insulated with an elastomeric flame retardant composition. 4,456,654, Cl. 428-383.000.
Koulouras, Katherine. Children's toys and particularly sand toys. 4,455,752, Cl. 33-41.00D.
Kouno, Kageaki: *See*—
Okumura, Yasushi; Okamura, Kazuhiko; Fugakawa, Yasuo; Ishikura, Tomoyuki; Kouno, Kageaki; and Lein, Joseph, 4,456,592, Cl. 424-177.000.
Kouse, Charles H.: *See*—
Idzik, Joseph J.; Kouse, Charles H.; and Herzog, James L., 4,455,746, Cl. 30-106.000.
Kovarik, Robert F., Jr.: *See*—
Penn, Steven M.; Berti, Jerome L.; and Kovarik, Robert F., Jr., 4,456,268, Cl. 277-106.000.
Koyanagi, Yuzo, to Sanwa Seiki Mfg. Co., Ltd. Method of detecting control error in digital control. 4,455,867, Cl. 73-119.00A.

Kozerski, David W.: *See*—
Lauritsen, Richard L.; and Kozerski, David W., 4,456,801, Cl. 200-83.00P.
Koziol, Konrad: *See*—
Zollner, Dieter; Zollner, Christine; Lauterbach-Dammler, Inge; Koziol, Konrad; and Pilbrow, Malcolm F., 4,456,519, Cl. 204-290.00R.
Kozlowski, Edward R.: *See*—
Williams, James E.; and Kozlowski, Edward R., 4,456,184, Cl. 241-92.000.
Kraft, Winfried; Pfeifer, Gerhard; Reichel, Artur; and Richter, Kurt, to Ernst Leitz Wetzlar GmbH. Traversing microtome with air bearings. 4,455,910, Cl. 83-874.000.
Krapcho, John, to E. R. Squibb & Sons, Inc. 4-Substituted dehydroprolines. 4,456,761, Cl. 548-532.000.
Krasjukov, Alexandr V.: *See*—
Paton, Boris E.; Samilov, Vladimir N.; Ivaschenko, Grigory P.; Krasjukov, Alexandr V and Balitsky, Vladimir M., deceased, 4,455,852, Cl. 72-82.000.
Krass, Dennis K.; and Richter, Sidney B., to PPG Industries, Inc. Herbicidally active benzoxazolyl acetophenone oxime derivatives. 4,456,466, Cl. 71-88.000.
Krasznai, Charles Z.; and Snyder, Paul V., to General Electric Company. Rotary cam and sensor temperature control for V-1000 toaster oven. 4,456,820, Cl. 219-398.000.
Kreager, William D.; Mason, Stanley I., Jr.; and Wilson, Larry W., to Frito-Lay, Inc. Method and apparatus for detecting possibly defectively-sealed bags. 4,455,810, Cl. 53-451.000.
Krejsa, Charles R.: *See*—
Wheeler, Donald J.; Cooper, Christopher; and Krejsa, Charles R., 4,456,189, Cl. 242-55.000.
Kremer, Ann S., to Eastfield Corporation. Mist generator and housing therefor. 4,456,179, Cl. 239-338.000.
Krepchin, Ira P.: *See*—
Burrill, Charles E., Jr.; Smirlock, Martin E.; and Krepchin, Ira P., 4,456,068, Cl. 166-303.000.
Kretschmer, Horst; Fleischer, Klaus; Gohler, Peter; Schingnitz, Manfred; Berger, Friedrich; Jegorow, Aleksander; Fedotov, Vasilij; Gavrilin, Vladimir; Gudymov, Ernest; Semenov, Vladimir; Achmatov, Igol; Majdurov, Nikolaj; and Avraamov, Evgenij, to Brennstoffinstitut Freiberg. Burner for gasification of powdery fuels. 4,455,949, Cl. 110-263.000.
Kristofferson, Clifford E.: *See*—
Barnes, Michael W.; Kristofferson, Clifford E.; and Manzara, Anthony P., 4,456,493, Cl. 149-19.400.
Kroeger, Donald E. Hunting blind and ice fishing shed. 4,456,272, Cl. 280-12.00S.
Kroeger, Wilbert L., III: *See*—
Bringol, Charles R.; and Kroeger, Wilbert L., III, 4,456,966, Cl. 364-900.000.
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Botzem, Werner; Laug, Reiner; Kroll, Hartmut; Schlich, Elmar; Anspach, Walter; Brendel, Karl; and Srostlik, Peter, 4,456,827, Cl. 250-506.100.
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Krude, Werner; Muller, Karl-Heinz; and Riemscheid, Helmut, to Uni-Cardan Aktiengesellschaft. Sealing boot for universal joint assembly. 4,456,269, Cl. 277-212.0FB.
Krueger, Hans; and Rehme, Hans, to Siemens Aktiengesellschaft. Method for making polarizers comprising a multiplicity of parallel electrically conductive strips on a glass carrier. 4,456,515, Cl. 204-192.00P.
Kruger, Robert A.; Baron, Stanley N.; and Liu, Ping Y., to Thomson-CSF Broadcast, Inc. Enhancement of fluroscopically generated images. 4,456,926, Cl. 358-111.000.
Krupp-Koppers GmbH: *See*—
Jakobi, Wilhelm, 4,456,505, Cl. 202-133.000.
KSM Fastening Systems Inc.: *See*—
Wilkinson, Harold C.; Gum, Charles E.; Howe, Rodney C.; Macinskas, Dean P.; Pease, Charles C.; Raycher, Robert J.; Rosen, Ronald; and Williams, Francis J., 4,456,808, Cl. 219-98.000.
Kubitza, Werner; and Mennicken, Gerhard, to Bayer Aktiengesellschaft. Use of clear coating based on organic polyisocyanates for coating sheet products based on polyvinyl chloride. 4,456,658, Cl. 428-424.600.
Kubo, Shinichi: *See*—
Taniguchi, Shozo; Shinke, Osamu; Ishii, Masami; and Kubo, Shinichi, 4,456,993, Cl. 371-10.000.
Kubota, Ltd.: *See*—
Hira, Takashi, 4,455,813, Cl. 56-11.800.
Kubota, Misao; Terao, Kazuhiko; and Shimada, Kenji, to Totoku Electric Co., Ltd. Filter and a manufacturing method therefor. 4,456,531, Cl. 210-409.000.
Kubota, Nobunori: *See*—
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,456,188, Cl. 242-35.50R.
Kubozuka, Takao; Ogawa, Naoki; and Yamaguchi, Hideya, to Nissan Motor Co., Ltd. Noise-shielding panel for engine. 4,456,092, Cl. 181-290.000.
Kuczenski, Steven R., to Tecumseh Products Company. Compression brake system. 4,455,977, Cl. 123-198.0DC.
Kudo, Mitsuru: *See*—
Nakagawa, Isao; Kondo, Kazuo; and Kudo, Mitsuru, 4,456,885, Cl. 330-107.000.
Kuehn, Scott L., to Champion International Corporation. Remote controlled line locking, slack pulling cable logging carriage. 4,456,131, Cl. 212-97.000.
Kuehnle, Manfred R.: *See*—
Szymanski, Michael J.; Weber, Harold J.; Kuehnle, Manfred R.; and Fraser, Kenneth D., 4,456,367, Cl. 355-10.000.
Kuge, Tsukasa; Tanigawa, Koichi; and Watanabe, Tsuyoshi, to Canon Kabushiki Kaisha. Method of and device for charging by corona discharge. 4,456,825, Cl. 250-324.000.
Kulite Semiconductor Products, Inc.: *See*—
Kurtz, Anthony D.; Nunn, Timothy A.; and Mallon, Joseph R., 4,456,901, Cl. 338-4.000.
Kumar, Mahesh, to United States of America, Navy. Dual-gate MESFET variable gain constant output power amplifier. 4,456,889, Cl. 330-279.000.
Kume, Tadashi, to Honda Giken Kogyo Kabushiki Kaisha. V-Type multi-cylinder internal combustion engine. 4,455,975, Cl. 123-52.0MV.
Kuntz, David W.: *See*—
Gardiner, Mark E.; and Kuntz, David W., 4,456,375, Cl. 356-239.000.
Kurahashi, Keizo: *See*—
Takahara, Kazuhiro; Kurahashi, Keizo; and Yamaguchi, Hisashi, 4,456,909, Cl. 340-781.000.
Kurahayashi, Takahisa; and Ojima, Juji, to Matsushita Reiki Co., Ltd.; and NHK Spring Co., Ltd. Refrigerant compressor. 4,456,437, Cl. 417-368.000.
Kuramochi, Koujiro; Watanabe, Kazuaki; and Terakura, Yukio, to Toyota Jidosha Kogyo Kabushiki Kaisha. Overdrive device for automatic transmissions. 4,455,890, Cl. 74-783.000.
Kureha Kagaku Kogyo Kabushiki Kaisha: *See*—
Nishimoto, Yoshiharu; and Yamazaki, Kengo, 4,456,646, Cl. 428-216.000.
Kuribayashi, Masaki: *See*—
Mabuchi, Minoru; Fujimura, Naoto; Ishikawa, Shozo; Takasu, Yoshio; Sakai, Kiyoshi; and Kuribayashi, Masaki, 4,456,671, Cl. 430-58.000.
Kuriyama, Akimasa: *See*—
Inoue, Kimio; Fukui, Tsugushi; Asai, Toshihiro; Nakagawa, Kazuhiko; and Kuriyama, Akimasa, 4,456,381, Cl. 366-97.000.
Kurtz, Anthony D.; Nunn, Timothy A.; and Mallon, Joseph R., to Kulite Semiconductor Products, Inc. Dielectrically isolated transducer employing single crystal strain gages. 4,456,901, Cl. 338-4.000.
Kushiro, Yukitoshi: *See*—
Tanaka, Fujio; Okamura, Yasuyuki; Kushiro, Yukitoshi; Ota, Chuichi; and Akiba, Shigeyuki, 4,456,998, Cl. 372-45.000.
Kushner, James; Constantine, Walter F.; Radadia, Dhiru; and Codega, Louis S., to Gulf & Western Manufacturing Company. Shielded cable and method of manufacture thereof. 4,456,785, Cl. 174-105.0SC.
Kuster, Kaspar: *See*—
Regenass, Willy; Giger, Gerhard; Kuster, Kaspar; and Achermann, Heinz, 4,456,389, Cl. 374-31.000.
Kusumoto, Sinsuke: *See*—
Ito, Hiroshi; and Kusumoto, Sinsuke, 4,456,107, Cl. 192-3.310.
Kutchukian, Remi: *See*—
Haeusler, Jochen; Friemert, Horst; and Kutchukian, Remi, 4,456,292, Cl. 294-65.500.
Kuus, Gijsbert: *See*—
Kroontje, Wiggert; and Kuus, Gijsbert, 4,455,998, Cl. 126-433.000.
Kuwahara, Akira. Motorized device for pushing or pulling a roller skate. 4,456,089, Cl. 180-180.000.
Kuze, Yoshikazu. Write-only sequence controller. 4,456,967, Cl. 364-900.000.
Kybato, Inc.: *See*—
Williams, Floyd G., 4,456,414, Cl. 410-80.000.
Kyle, James C., to Kyle, James C. Terminal assembly for heart pacemaker. 4,456,786, Cl. 174-152.0GM.
L. E. Mason Co.: *See*—
Frank, John R., 4,456,145, Cl. 220-242.000.
L M B Hand Rehab Products: *See*—
Barber, Lois M.; and Jackson, William H., 4,456,002, Cl. 128-77.000.
La Nationale S.A.: *See*—
Beyer, Karl, 4,456,346, Cl. 351-153.000.
Laakaniemi, Richard N.; and Wichman, Paul E., to Johnson Controls, Inc. Modular fluid control apparatus and method of making. 4,456,168, Cl. 236-49.000.
Laboratoires Panmedica: *See*—
Laruelle, Claude; and Lepant, Marcel, 4,456,611, Cl. 424-274.000.
Lachmann, Burkhard: *See*—
Rottmaier, Ludwig; Merten, Rudolf; Siebourg, Wolfgang; and Lachmann, Burkhard, 4,456,715, Cl. 524-100.000.
Lagerstedt, Arne; and Lidstrand, Eskil, to Craelius AB. Device for reciprocating motion of a rotating drilling body of a drilling machine. 4,456,077, Cl. 173-147.000.
Lagoutte, Serge: *See*—
Bacroix, Marcel; Menini, Joseph; and Lagoutte, Serge, 4,456,040, Cl. 141-150.000.
Lam, Chung H.; and Peterson, Charles W., Jr., to International Business Machines Corporation. Field effect level sensitive circuit. 4,456,841, Cl. 307-530.000.
Lamb-Weston, Inc.: *See*—
Glantz, Jerome J.; and Doenges, Michael G., 4,456,624, Cl. 426-96.000.
Lambert, Jean-Pierre; and L'Huillier, Michel, to Polysar International S.A. Water clarification. 4,456,534, Cl. 210-725.000.

Landmann, Manfred: *See*—
Becker, Wilfried; Pepina, Oswald; and Landmann, Manfred, 4,455,944, Cl. 102-530.000.

Landt, Harvey L.; and Snider, Glenn R., to Rockwell International Corporation. Band selectable tunable bandpass filter. 4,456,895, Cl. 333-174.000.

Lang, Armin; and Cerny, Walter, to Zahnradfabrik Friedrichshafen, AG. Vehicle power steering apparatus. 4,456,087, Cl. 180-142.000.

Langberg, Edwin, to Johnson & Johnson. Detecting the presence or absence of a coating on a substrate. 4,456,374, Cl. 356-237.000.

Lange, Jurgen; and Harty, Alexander. Adjustable garden chair. 4,456,294, Cl. 297-21.000.

Lapart, Gerard, to Les Cables de Lyon. Distributed-constant resistance for use as a high dissipation load at hyperfrequencies. 4,456,894, Cl. 333-22.00R.

LaPointe, Gary S.: *See*—
Cerankowski, Leon D.; LaPointe, Gary S.; and Mattucci, Neil C., 4,456,674, Cl. 430-221.000.

Larson, Ivar W.: *See*—
Olander Jr., Emil E.; James, Rex I.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,456,964, Cl. 364-710.000.

Laruelle, Claude; and Lepant, Marcel, to Laboratoires Panmedica. Derivatives of 2-[3-(3-indoly)2-amino propionyloxy] acetic acid, and seritoning increasing use thereof. 4,456,611, Cl. 424-274.000.

LaSalle Machine Tool, Inc.: *See*—
Szczepanski, Francis A., 4,456,117, Cl. 198-461.000.

Lasky, Robert; Lobach, Donald C.; and Bauer, Edward J., to Campbell Soup Company. Method and apparatus for application of paint to metal substrates. 4,456,804, Cl. 219-10.430.

Lattin, Gary A., to Medtronic, Inc. Iontophoretic and electrical tissue stimulation device. 4,456,012, Cl. 128-420.00R.

Laug, Reiner: *See*—
Botzem, Werner; Laug, Reiner; Kroll, Hartmut; Schlich, Elmar; Anspach, Walter; Brendel, Karl; and Srostlik, Peter, 4,456,827, Cl. 250-506.100.

Laurent, Henry; and Wiechert, Rudolf, to Schering Aktiengesellschaft. D-Homo-4,17-androstadien-3-one, its preparation and pharmaceutical use. 4,456,620, Cl. 424-331.000.

Lauritsen, Richard L.; and Kozerski, David W., to Singer Company, The. Pressure switch. 4,456,801, Cl. 200-83.00P.

Laus, Heinrich: *See*—
Bruggemann, Werner; and Laus, Heinrich, 4,456,035, Cl. 139-398.000.

Lauterbach-Dammler, Inge: *See*—
Zollner, Dieter; Zollner, Christine; Lauterbach-Dammler, Inge; Koziol, Konrad; and Pilbrow, Malcolm F., 4,456,519, Cl. 204-290.00R.

LaValle, Dean R.; and McLain, Philip A., to PaR Systems Corp. Control system for automatic material handling crane. 4,456,132, Cl. 212-160.000.

Lavorazione Materie Plastiche L.M.P. S.p.A.: *See*—
Ragazzini, Franco; and Colombo, Roberto, 4,456,573, Cl. 264-53.000.

Lawrence, Victor B.: *See*—
Gersho, Allen; and Lawrence, Victor B., 4,457,004, Cl. 375-67.000.

Lawson, Ashby G.: *See*—
MacConochie, Ian O.; Lawson, Ashby G.; and Kelly, H. Neale, 4,456,208, Cl. 244-158.00A.

Lawson, Gerald P.: *See*—
Callanan, Dennis T.; Lawson, Gerald P.; and Reardon, Francis J., 4,455,900, Cl. 82-4.00A.

Lear Siegler, Inc.: *See*—
Carrington, Wilbur A.; Fredricks, Ronald J.; Gubbins, Harry L.; Eckley, Gordon P.; Perfitt, Thomas E.; and Page, Jerry L., 4,456,376, Cl. 356-350.000.

Leavens, William H., to Waltec, Inc. Sink with colander. 4,456,021, Cl. 134-85.000.

Lee, E. Paul; McCormick, Frederick H.; Vietmeier, Dennis P.; Harrington, Neal C.; and Clothier, Donald R., to Honeywell Information Systems Inc. Keyboard identification sequence. 4,456,972, Cl. 364-900.000.

Lee, Fui-Tseng H.; and Green, Joseph, to FMC Corporation. Polyurethane coating composition with a curative containing polyhydroxyalkylphosphine oxide. 4,456,742, Cl. 528-45.000.

Lee, Fui-Tseng H.; and Green, Joseph, to FMC Corporation. Polyurethane adhesive composition and a curative system containing a polyhydroxyalkyiphosphine oxide. 4,456,743, Cl. 528-60.000.

Lee, Kang I.; Jensen, William; and Cukor, Peter, to GTE Laboratories Incorporated. High resolution lithographic resist of negative working cationic vinyl polymer. 4,456,678, Cl. 430-279.000.

Lee, Shy-Fuh; and Henrick, Clive A., to Zoecon Corporation. Phenoxy- and pyridyloxy-phenoxyalkyl phosphinates and related sulfur compounds for weed control. 4,456,464, Cl. 71-87.000.

Lee, Shy-Fuh, to Zoecon Corporation. Phenoxy- and pyridyloxy-phenylphosphinates and their use in weed control. 4,456,465, Cl. 71-87.000.

Legler, John G.: *See*—
Clark, Donald L.; and Legler, John G., 4,456,042, Cl. 144-129.000.

Leibovitz, Howard. External clamping device for inflatable air bag. 4,455,721, Cl. 24-346.000.

Leick, Roger: *See*—
Mathgen, Georges; Scherer, Robert; Prum, Charles; and Leick, Roger, 4,457,002, Cl. 373-95.000.

Lein, Joseph: *See*—
Okumura, Yasushi; Okamura, Kazuhiko; Fugakawa, Yasuo; Ishikura, Tomoyuki; Kouno, Kageaki; and Lein, Joseph, 4,456,592, Cl. 424-177.000.

Leland Stanford Jr. Univ., The Board of Trustees of: *See*—
Shaw, H. John; and Pavlath, George A., 4,456,377, Cl. 356-350.000.

Lemarchand, Jacques: *See*—
Guimard, Andre ; and Lemarchand, Jacques, 4,455,875, Cl. 73-708.000.

Lenhart, Ronald A., to Precision Metal Fabricators, Inc. Air table system. 4,456,406, Cl. 406-88.000.

Lenoir, John; and Jan, Gerald, to Ciba Geigy AG. Azo dyes containing phosphamic acid diester groups. 4,456,668, Cl. 430-17.000.

Lenselink, Willem, to Polak's Frutal Works, B.V. Nitriles and use as perfume chemicals. 4,456,561, Cl. 260-464.000.

Leonard, Ralph W., to United States Steel Corporation. Hot-dip aluminum-zinc coating method and product. 4,456,663, Cl. 428-653.000.

Leonardo, Ignazio, to Diamond Communication Products, Inc. Tap bracket or the like. 4,455,716, Cl. 24-115.00A.

Lepant, Marcel: *See*—
Laruelle, Claude; and Lepant, Marcel, 4,456,611, Cl. 424-274.000.

Les Cables de Lyon: *See*—
Lapart, Gerard, 4,456,894, Cl. 333-22.00R.

Leslie, John F.; Greasham, Randolph L.; and Hulbert, Matthew H., to International Minerals & Chemical Corp. Biological flocculation of mineral slimes. 4,456,532, Cl. 210-602.000.

Leung, Patrick C.: *See*—
Nally, Robert B.; Akister, James F.; Leung, Patrick C.; and Vance, Eric J., 4,457,015, Cl. 382-45.000.

Lever Brothers Company: *See*—
Cox, Roger B.; and Steer, David C., 4,456,714, Cl. 524-56.000.
Van Heteren, Jan; Poot, Cornelis; Reckweg, Freek; and Stewart, Murray F., 4,456,627, Cl. 426-603.000.

Levieux, Philippe L. P.: *See*—
Cohen, Violette; and Levieux, Philippe L. P., 4,456,953, Cl. 364-200.000.

Levy, Daniele: *See*—
Henry, Raymond; Simon, Jacques; Levy, Daniele; Carpenter, Jean-Francois; and Defaut, Bernard, 4,456,334, Cl. 350-320.000.

Lewellen, Richard R., to Nordson Corporation. Housing for apparatus for melting and dispensing thermoplastic material. 4,456,151, Cl. 222-146.0HE.

Lewellyn, Morris E., to American Cyanamid Company. Process for the preparation of N-allyl-O-alkyl thionocarbamates. 4,456,560, Cl. 260-455.00A.

Lewis, David; Kalina, Davida W.; and Tsai, Tsung-Ein, to Standard Oil Company (Indiana). Composition and method for making conductive polymers. 4,456,548, Cl. 252-500.000.

Leybold Heraeus GmbH: *See*—
Henning, Hans-Heinrich; and Pfaff, Hansen, 4,456,433, Cl. 417-53.000.

Leyrer, Reinhold J.; and Saenger, Dietrich, to BASF Aktiengesellschaft. Production of relief images or resist images by a positive-working method. 4,456,679, Cl. 430-326.000.

LGZ Landis & Gyr Zug AG: *See*—
Schaub, Thomas, 4,456,992, Cl. 371-6.000.

L'Huillier, Michel: *See*—
Lambert, Jean-Pierre; and L'Huillier, Michel, 4,456,534, Cl. 210-725.000.

Lichty, Terry K. External compression bone fixation device. 4,456,005, Cl. 128-92.00A.

Lidstrand, Eskil: *See*—
Lagerstedt, Arne; and Lidstrand, Eskil, 4,456,077, Cl. 173-147.000.

Limbacher, Bernhard, to Fichtel & Sachs AG. Hydraulic control system for a clutch. 4,456,111, Cl. 192-85.0CA.

Limbic Training Systems, Inc.: *See*—
Stahly, Frederick A., 4,456,347, Cl. 351-158.000.

Lin, Burn J., to International Business Machines Corporation. Optical projection printing threshold leveling arrangement. 4,456,371, Cl. 355-71.000.

Lin, Wen, to AT&T Technologies, Inc. Double crucible Czochralski crystal growth method. 4,456,499, Cl. 156-605.000.

Lindberg, Jorgen F.: *See*—
Stromer, Carl-Axel; Tronslien, Erling; and Lindberg, Jorgen F., 4,456,794, Cl. 179-103.000.

Lindner, Christian; and Ott, Karl-Heinz, to Bayer Aktiengesellschaft. Rubber powders. 4,456,734, Cl. 525-310.000.

Lindner, Gerhard: *See*—
Christmann, Wolfgang; Lindner, Gerhard; and Lingens, Paul, 4,455,914, Cl. 86-1.00R.

Lindre, Jaan, to Ford Motor Company. Brake pad with electrical contacts for brake warning systems. 4,456,098, Cl. 188-1.110.

Lingens, Paul: *See*—
Christmann, Wolfgang; Lindner, Gerhard; and Lingens, Paul, 4,455,914, Cl. 86-1.00R.

Linstrumelle, Roger B.: *See*—
Bayle-Laboure, Gerard J. P.; Buisson, Mark F. B.; Linstrumelle, Roger B.; and Pachot, Jean-Claude, 4,455,822, Cl. 60-39.822.

Lintilhac, Philip M.; and Vesecky, Thompson B. Sterilizable tissue squeezing device and method. 4,456,683, Cl. 435-3.000.

Lipp, Herbert: *See*—
Pietschmann, Helmut; and Lipp, Herbert, 4,456,297, Cl. 297-316.000.

Lissajoux, Pierre J.; and Rigo, Marcel L., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Device to correct an unbalance of the rotor of turbine engines. 4,455,887, Cl. 74-573.00R.

List, Hans: *See—*
Kirchweger, Karl; and Knopf, Franz, 4,455,971, Cl. 123-41.700.
List, Harold A., to Railway Engineering Associates, Inc. Articulated trucks. 4,455,946, Cl. 105-168.000.
Little, Richard E.: *See—*
Kline, Samuel J.; and Little, Richard E., 4,456,788, Cl. 179-7.10R.
Litton Systems, Inc.: *See—*
Alftine, David N., 4,455,861, Cl. 73-23.000.
Liu, Ping Y.; and Rosenquist, Niles R., to General Electric Company. Compositions comprising polycarbonates, acrylate resins, and aliphatic hydrocarbons. 4,456,725, Cl. 524-476.000.
Liu, Ping Y.: *See—*
Kruger, Robert A.; Baron, Stanley N.; and Liu, Ping Y., 4,456,926, Cl. 358-111.000.
Lo, Young S.: *See—*
Sheehan, John C.; and Lo, Young S., 4,456,755, Cl. 544-23.000.
Lobach, Donald C.: *See—*
Lasky, Robert; Lobach, Donald C.; and Bauer, Edward J., 4,456,804, Cl. 219-10.430.
Lockheed Corporation: *See—*
Cronin, Michael J., 4,456,830, Cl. 290-27.000.
Lodrick, Lawrence E. Game with an icosahedral geodesic sphere board. 4,456,258, Cl. 273-241.000.
Loevendie, Rudolf H.: *See—*
in't Hout, Henk H.; and Loevendie, Rudolf H., 4,456,119, Cl. 198-535.000.
Lohraff, Larry G.: *See—*
Gaiser, Robert F.; Lohraff, Larry G.; and Myers, Lawrence R., 4,455,830, Cl. 60-562.000.
Gaiser, Robert F.; Lohraff, Larry G.; and Myers, Lawrence R., 4,455,832, Cl. 60-581.000.
Long, James H.: *See—*
Terhune, Robert D.; Bazin, George L., II; Long, James H.; and Nguyen, Linh V., 4,455,761, Cl. 34-14.000.
L'Oreal: *See—*
Vanlerberghe, Guy; Sebag, Henri; and Pierre, Rene, 4,456,586, Cl. 424-70.000.
Lorenz, Gordon; and Gehring, Ken, to Petro-Canada Exploration Inc.; Her Majesty the Queen in right of the Province of Alberta, Government of the Province of Alberta, Department of Energy and Natural Resources; PanCanadian Petroleum Limited; Esso Resources Canada Ltd.; Canada-Cities Service, Ltd.; Gulf Canada Resources Inc.; Alberta Energy Company Ltd.; Hudson's Bay Oil and Gas Company Limited; and Petrofina Canada Inc., a part interest. Skimmer apparatus for recovering bitumen. 4,456,536, Cl. 210-776.000.
Lotsko, Catherine A.: *See—*
Anderson, Herbert R., Jr.; Araps, Constance J.; and Lotsko, Catherine A., 4,456,675, Cl. 430-256.000.
Loudon, James R., to Graph Tech Inc. Dampening apparatus for lithographic press. 4,455,938, Cl. 101-148.000.
Louis, Charles A., III: *See—*
Price, Donald A., Jr.; and Louis, Charles A., III, 4,456,202, Cl. 244-3.150.
Louthan, John D., to LTV Aerospace and Defense Company. Aircraft propulsion system having a translatable, directionable exhaust nozzle. 4,456,203, Cl. 244-23.00D.
Loven, James F. Permanent magnetic A.C.-D.C. motor. 4,456,858, Cl. 318-138.000.
Lowrance Electronics, Inc.: *See—*
McBride, William E., 4,456,210, Cl. 248-205.500.
LTV Aerospace and Defense Company: *See—*
Louthan, John D., 4,456,203, Cl. 244-23.00D.
Lu, Sun: *See—*
Chung, Chi H.; Lu, Sun; and Chung, David B., 4,456,336, Cl. 350-338.000.
Lubrizol Corporation, The: *See—*
Riple, David E., 4,456,538, Cl. 252-32.70E.
Lucas, Floyd. Cable pulling apparatus. 4,456,225, Cl. 254-134.3FT.
Lucas, Hermann-Josef: *See—*
Brinkmann, Bernd; and Lucas, Hermann-Josef, 4,456,718, Cl. 524-114.000.
Lucas Industries: *See—*
Ward, Melvyn, 4,456,578, Cl. 419-8.000.
Lucas Industries Limited: *See—*
Margetts, Hugh G., 4,455,827, Cl. 60-547.100.
Mortimer, Ivan; Farr, Glyn P. R.; and Yardley, Alfred, 4,456,104, Cl. 188-349.000.
Rath, Heinrich B., 4,456,309, Cl. 303-10.000.
Ludecke, Otto A.: *See—*
Bly, Kenneth B.; Ludecke, Otto A.; and Smith, Richard H., 4,455,823, Cl. 60-311.000.
Luders, Albrecht: *See—*
Opel, Paul; Herbst, Klaus; Brinkmann, Heinz; Luders, Albrecht; and Wolsdorf, Hans P., 4,456,308, Cl. 301-9.0DN.
Luders, Walter; and Burg, Karlheinz, to Hoechst Aktiengesellschaft. Filler-containing plastic molding composition, a process for its preparation, and its use. 4,456,710, Cl. 523-200.000.
Ludke, Heimo: *See—*
Hille, Lothar; Ludke, Heimo; and Hansjosten, Nikolaus, 4,456,707, Cl. 521-99.000.
Lundgren, Bengt. Device for storage of shoes and similar. 4,456,316, Cl. 312-229.000.
Lundstrom, Robert W.: *See—*
Kaufmann, Kenneth M.; Lundstrom, Robert W.; and Beer, Robert E., 4,456,355, Cl. 354-299.000.
L'Unite Hermetique: *See—*
Crespin, M. Joel, 4,456,431, Cl. 416-189.000.
Lupova, Ljudmila M.; Fedorova, Lidia G.; Grebeshova, Renata N.; Aleshina, Zinaida P.; Anion, Alexandr G.; Belirsky, Alexandr L.; and Alexeeva, Margarita I., to Vsesojuzny Nauchno-Issledovatelsky Biotecknichesky Institut. Enzyme-containing cetergent composition for presterilization treatment of medical instruments and equipment. 4,456,544, Cl. 252-174.120.
Lurmark Limited: *See—*
Lury, Marcus, 4,456,180, Cl. 239-397.000.
Lury, Marcus, to Lurmark Limited. Spray nozzle assemblies. 4,456,180, Cl. 239-397.000.
Lyman, Francis J.: *See—*
Lyman, Joseph A., 4,455,970, Cl. 122-20.00B.
Lyman, George, to Data Packaging Corporation. Venting arrangement for covered containers. 4,456,137, Cl. 215-230.000.
Lyman, Joseph A., to Lyman, Francis J.; Jacobs, Theresa M.; Socia, Lauralee A.; Lyman, Lawrence A.; Lyman, Mary F.; Sullivan, Richard F.; and Lyman, Joseph A., a part interest. Add-on boiler. 4,455,970, Cl. 122-20.00B.
Lyman, Lawrence A.: *See—*
Lyman, Joseph A., 4,455,970, Cl. 122-20.00B.
Lyman, Mary F.: *See—*
Lyman, Joseph A., 4,455,970, Cl. 122-20.00B.
Mabuchi, Minoru; Fujimura, Naoto; Ishikawa, Shozo; Takasu, Yoshio; Sakai, Kiyoshi; and Kuribayashi, Masaki, to Canon Kabushiki Kaisha. Electrophotographic photosensitive member having a photosensitive layer containing a hydrazone compound. 4,456,671, Cl. 430-58.000.
MacAvoy, David W.: *See—*
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Wilkinson, Harold C.; Gum, Charles E.; Howe, Rodney C.; Macinskas, Dean P.; Pease, Charles C.; Raycher, Robert J.; Rosen, Ronald; and Williams, Francis J., 4,456,808, Cl. 219-98.000.
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Churchland, Mark T., 4,456,498, Cl. 156-275.500.
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Yamada, Tatsuzo, 4,455,859, Cl. 72-447.000.
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Maes, Michel E.; Shaw, Robert L.; and Reinsch, Royal L., to Energy Sciences Partners, Ltd. System for making an aqueous slurry-type blasting composition. 4,456,494, Cl. 149-21.000.
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Silvy, Dorrel R.; and Stanis, William J., 4,456,981, Cl. 365-234.000.
Mahler, Carl P. B., II, to B. F. Goodrich Company, The. Agitator hub. 4,456,382, Cl. 366-276.000.
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Kretschmer, Horst; Fleischer, Klaus; Gohler, Peter; Schingnitz, Manfred; Berger, Friedrich; Jegorow, Aleksander; Fedotov, Vasilij; Gavrilin, Vladimir; Gudymov, Ernest; Semenov, Vladimir; Achmatov, Igol; Majdurov, Nikolaj; and Avraamov, Evgenij, 4,455,949, Cl. 110-263.000.
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Malenotti, Franco, to Moto Laverda S.p.A. Device for the adjustment of the axis of the footrest in motorcycles. 4,456,090, Cl. 180-219.000.
Malikowski, Willi; Szulczyk, Andreas; Bohm, Wolfgang; and Wolmer, Roger, to Degussa Aktiengesellschaft. Electrical contact piece. 4,456,662, Cl. 428-632.000.
Mallick, George T., Jr.; and Maynard, Pamela M., to Westinghouse Electric Corp. Motor control apparatus with input validator. 4,456,867, Cl. 318-778.000.
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Goudarzi, Khosrow; and Maltos, Fernando I., 4,455,929, Cl. 99-637.000.

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Atago, Takeshi; and Manaka, Toshio, 4,455,978, Cl. 123-339.000.

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Chu, Mosi; Chiang, David; and Manber, Solomon, 4,456,240, Cl. 271-4.000.

Mandell, Leo; Eklund, Vidar; Ekman, Kurt; Huttunen, Jouko; and Turunen, Olli, to Neste Oy. Procedure for precipitating cellulose derivative. 4,456,749, Cl. 536-30.000.

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Edelmann, Hermann; Pasch, Manfred; Klose, Sigmar; Haar, Hans-Peter; and Mann, Karlheinz, 4,456,581, Cl. 422-72.000.

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Opel, Paul; Herbst, Klaus; Brinkmann, Heinz; Luders, Albrecht; and Wolsdorf, Hans P., 4,456,308, Cl. 301-9.0DN.

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Henders, Siegfried, 4,456,054, Cl. 164-454.000.

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Rose, Robert F.; and Manning, Lonnie W., 4,456,822, Cl. 250-223.00R.

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Yamada, Junzo; Mano, Tsuneo; and Inoue, Junichi, 4,456,980, Cl. 365-200.000.

Manufacture de Produits Chimiques Protex: *See*—
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Bereziat, Claude A., 4,456,138, Cl. 215-232.000.

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Clarke, Wayne C., 4,456,649, Cl. 428-285.000.

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Barnes, Michael W.; Kristofferson, Clifford E.; and Manzara, Anthony P., 4,456,493, Cl. 149-19.400.

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Pinner, Felton R., Jr., 4,456,067, Cl. 166-279.000.

Marbourg, Edgar F., Jr. Tool for capture, control and manipulation of threaded fasteners. 4,455,898, Cl. 81-454.000.

Marelli Autronica S.p.A.: *See*—
Rodari, Gianpiero, 4,456,870, Cl. 322-29.000.

Margetts, Hugh G., to Lucas Industries Limited. Master cylinder and servo booster assemblies for vehicle braking systems. 4,455,827, Cl. 60-547.100.

Marin, Roger A., to Vidicraft, Inc. Video circuitry. 4,456,927, Cl. 358-153.000.

Markley, Theodore J.; Galdun, Daniel J.; Clark, Charles E.; Henderson, Robert G.; and Jencen, Frank W., to Allen-Bradley Company. Industrial terminal with elastic bumpers. 4,456,315, Cl. 312-137.000.

Markow, Edward G.; and Kopsco, Michael A., to Grumman Aerospace Corporation. Dual-modulus band banded tire. 4,456,048, Cl. 152-330.0RF.

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Osborne, William E.; and Ketre, Nicholas A., 4,455,919, Cl. 89-138.000.

Marosi, Laszlo; Stabenow, Joachim; and Schwarzmann, Matthias, to BASF Aktiengesellschaft. Manufacture of nitrogen-containing crystalline metal silicates having a zeolite structure. 4,456,582, Cl. 423-277.000.

Marris, Richard E. F., to K. Shoemakers Limited. Footwear manufacture. 4,455,702, Cl. 12-142.00R.

Marsh, Susan K.; Owen, Hartley; and Wright, Bernard S., to Mobil Oil Corporation. Catalytic conversion system for oligomerizing olefinic feedstock to produce heavier hydrocarbons. 4,456,781, Cl. 585-533.000.

Marsh, Susan K.: *See*—
Owen, Hartley; Marsh, Susan K.; and Wright, Bernard S., 4,456,779, Cl. 585-415.000.

Marshall, James F.: *See*—
Jones, Dennis C.; and Marshall, James F., 4,456,178, Cl. 239-265.390.

Marshall, Robert E.: *See*—
O'Rourke, J. Cam; Marshall, Robert E.; Bercha, Frank G.; and Pilkington, G. Roger, 4,455,958, Cl. 114-40.000.

Martin, Clifford M. Electro-mechanical steady state thermostat. 4,456,169, Cl. 236-78.00D.

Martin, Henry, to Ciba-Geigy Corporation. Aminoglyoxylonitrile oximiro carbamates for the protection of crops against injury by herbicides. 4,456,468, Cl. 71-88.000.

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Gottstein, Emil, 4,456,298, Cl. 297-353.000.

Marttala, Tapani; and Saramaki, Kari, to A.Ahlstrom Osakeyhtio. Method for controlling the alkalinity of feed circulation when prehydrolyzing wood chips. 4,456,750, Cl. 536-59.000.

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Henderson, James A.; and Marx, Gary E., 4,456,329, Cl. 350-96.160.

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Grossi, Anthony V.; Bolen, Charles E.; Hahn, Louis T.; and Marzocchi, Alfred, 4,456,633, Cl. 427-138.000.

Marzolph, Gerhard; and Blank, Heinz U., to Bayer Aktiengesellschaft. Process for the preparation of optionally substituted fluoro-nitro-benzaldehydes. 4,456,772, Cl. 568-424.000.

Masaki, Nobuo; Tokuda, Hiroyuki; Furukawa, Yoshiki; Sakurai, Mitsuru; and Nitanda, Hiroshi, to Canon Kabushiki Kaisha. Portable image forming apparatus. 4,456,362, Cl. 355-3.00R.

Maschinenfabrik Andritz Aktiengesellschaft: *See*—
Eustacchio, Peter; and Koren, Erwin, 4,456,530, Cl. 210-396.000.

Maschinenfabrik Gehring GmbH & Co., KG: *See*—
Gehring, Heinz, 4,455,789, Cl. 51-34.00J.

Maschinenfabrik Walter Scheele BmbH & Co. KG: *See*—
Griesbach, Rolf, 4,455,921, Cl. 91-191.000.

Maselli, John A.; and Horwath, Robert O., to Nabisco Brands, Inc. Combination semi-continuous and batch process for preparation of vinegar. 4,456,622, Cl. 426-17.000.

Maslanka, William W.; and Spence, Gavin G., to Hercules Incorporated. Organic pigments. 4,456,724, Cl. 524-458.000.

Mason, Daniel W.; and Stevenson, David W., to Motorola, Inc. Optoelectronic coupler housing. 4,456,828, Cl. 250-551.000.

Mason, Stanley I., Jr.: *See*—
Kreager, William D.; Mason, Stanley I., Jr.; and Wilson, Larry W., 4,455,810, Cl. 53-451.000.

Massachusetts Institute of Technology: *See*—
Growdon, John H.; and Wurtman, Richard J., 4,456,598, Cl. 424-199.000.
Milgram, Jerome H., 4,456,071, Cl. 166-356.000.
Sheehan, John C.; and Lo, Young S., 4,456,755, Cl. 544-23.000.

Massey-Ferguson Industries Limited: *See*—
Crawford, Alexander, 4,455,930, Cl. 100-3.000.

Masuda, Seiichi; Matsuo, Tohru; Ohkita, Yoshimichi; Aoki, Takeo; Nakajima, Hidemasa; Okamura, Shozo; Hirata, Takeyuki; and Anezaki, Shoji, to Sumitomo Metal Industries, Inc. Production of ultra-low phosphorus steel. 4,456,477, Cl. 75-51.000.

Mathgen, Georges; Scherer, Robert; Prum, Charles; and Leick, Roger, to Arbed S.A. Electrode seal assembly for metallurgical furnace. 4,457,002, Cl. 373-95.000.

Mathis, Melwyn L.: *See*—
Cullick, Alvin S.; Mathis, Melwyn L.; and Warner, Bert J., 4,455,860, Cl. 73-19.000.

Matsuda, Fujio; Kato, Takazo; and Kiyoura, Tadamitsu, to Mitsui Toatsu Chemicals, Incorporated. Process for the preparation of indoles. 4,456,760, Cl. 548-508.000.

Matsuda, Yasuo; Honda, Kazuo; Fukui, Hiroshi; Amano, Hisao; and Musha, Shuji, to Hitachi, Ltd. Gate circuit for gate turn-off thyristor. 4,456,836, Cl. 307-252.00C.

Matsui, Kazuhiro, to Kitagawa Industries Co., Ltd. Cable clamp. 4,455,715, Cl. 24-16.0PB.

Matsumoto, Kouichi: *See*—
Tanaka, Kentaro; Kondo, Eiji; Matsumoto, Kouichi; Shoji, Jun'ichi; and Tsuji, Naoki, 4,456,686, Cl. 435-119.000.

Matsumoto, Masataka, to Citizen Watch Company Limited. Watch case structure. 4,456,388, Cl. 368-294.000.

Matsumoto, Osamu: *See*—
Eguchi, Yoshitugu; Matsumoto, Osamu; and Imada, Kiyoshi, 4,456,572, Cl. 264-53.000.

Matsuo, Masayuki. Hand simulator. 4,455,963, Cl. 116-306.000.

Matsuo, Tohru: *See*—
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Matsushima, Takeo: *See*—
Yoshimi, Akiro; Kamiya, Michihiko; Kojima, Yasuhumi; Ootsuka, Fumio; and Matsushima, Takeo, 4,456,055, Cl. 165-12.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Honjo, Masahiro; and Tomita, Masao, 4,456,932, Cl. 360-36.100.
Ogino, Yoshio; Kobayashi, Takao; Tsuda, Yuji; and Nishimura, Hitoshi, 4,456,807, Cl. 219-10.770.
Sugino, Takashi; Itoh, Kunio; Wada, Masaru; and Shimizu, Hirokazu, 4,456,999, Cl. 372-45.000.
Takayama, Ryoichi; Tokushima, Akira; Ueshiba, Nozomu; and Ise, Yukihiko, 4,456,849, Cl. 310-324.000.
Yubakami, Keiichi; Takashima, Yuji; and Shimotsuma, Wataru, 4,456,669, Cl. 430-45.000.

Matsushita Reiki Co., Ltd.: *See*—
Kurahayashi, Takahisa; and Ojima, Juji, 4,456,437, Cl. 417-368.000.

Matsuzawa, Masanao: *See*—
Gomi, Yoshifumi; Matsuzawa, Masanao; Ikeda, Yoshito; and Morita, Yoshihisa, 4,456,393, Cl. 400-124.000.

Matt, Bernhard; Woringer, Theo; and Zouzoulas, Gerassime, to BBC Brown, Boveri & Company, Limited. Ring combustion chamber with ring burner for gas turbines. 4,455,840, Cl. 60-737.000.

Mattes, Hans G.: *See*—
Baker, William E.; Froehlich, Fritz E.; and Mattes, Hans G., 4,456,793, Cl. 179-99.00R.

Matthes, Wolfgang; and Ubl, Heinz, to Transformatoren Union AG. Device and method for utilization of heat due to losses in transform-

ers or choke coils which are internally cooled by a liquid. 4,456,899, Cl. 336-55.000.
Mattucci, Neil C.: *See*—
Cerankowski, Leon D.; LaPointe, Gary S.; and Mattucci, Neil C., 4,456,674, Cl. 430-221.000.
Matusek, Robert D., to Cleveland Machine Controls, Inc. Apparatus for automatic calibration of servo response. 4,456,863, Cl. 318-572.000.
Max Factor & Co.: *See*—
Kay, Nathan; and Kay, Robin M., 4,456,124, Cl. 206-463.000.
Maxwell Laboratories, Inc.: *See*—
Kent, Henry R., 4,456,139, Cl. 215-252.000.
May, John B.: *See*—
DiMassimo, Donald V.; and May, John B., 4,456,910, Cl. 340-784.000.
Maynard, Pamela M.: *See*—
Mallick, George T., Jr.; and Maynard, Pamela M., 4,456,867, Cl. 318-778.000.
Maysilles, Lynn A. Twist drill sharpening machine. 4,455,786, Cl. 51-46.000.
MBB/VFW GmbH: *See*—
Engel, Hinrich; Koch, Eckhard; and Vogg, Gunther, 4,456,207, Cl. 244-137.00R.
McBride, William E., to Lowrance Electronics, Inc. Transducer mounting. 4,456,210, Cl. 248-205.500.
MCC Associates: *See*—
Chu, Moni; Chiang, David; and Manber, Solomon, 4,456,240, Cl. 271-4.000.
McCandless, John H. Internal combustion engines. 4,455,976, Cl. 123-197.00A.
McCarthy, Bruce C., to USM Corporation. Heat fusible-expandable mastic for automobile floor pans. 4,456,705, Cl. 521-83.000.
McCarty, William V.; and Thiemann, Donald J., to General Electric Company. Modular inlet gearbox for a gas turbine engine. 4,456,425, Cl. 415-122.00R.
McCleerey, Earl W., to AMP Incorporated. Commoning strip. 4,456,317, Cl. 339-14.00R.
McCloskey, Thomas H.: *See*—
Binstock, Morton H.; McCloskey, Thomas H.; and Podolsky, Leaman B., 4,455,836, Cl. 60-663.000.
McCollough, John K.; and Pascoe, William M., Sr., to Milliken Research Corporation. Yarn heater. 4,456,818, Cl. 219-373.000.
McCombie, Stuart W., to Schering Corporation. (5R, 6S, 8R-6-(1-Hydroxyethyl)-2-(2-[methylaminocarbonyl]-ethylthio)-penem-3-carboxylic acid. 4,456,609, Cl. 424-270.000.
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Lee, E. Paul; McCormick, Frederick H.; Vietmeier, Dennis P.; Harrington, Neal C.; and Clothier, Donald R., 4,456,972, Cl. 364-900.000.
McCrum, Russell C., to Boeing Company, The. Two-way fuse for a fluid line. 4,456,029, Cl. 137-498.000.
McCunn, Thomas H.: *See*—
Deverell, Harry E.; and McCunn, Thomas H., 4,456,483, Cl. 75-128.00N.
Nichol, Thomas J.; and McCunn, Thomas H., 4,456,482, Cl. 75-126.00C.
McDonald, Ernest. Apparatus for stringing a racquet. 4,456,254, Cl. 273-73.00A.
McFall, L. Victor: *See*—
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McFarland, Clyde M.: *See*—
Christensen, Robert F., 4,455,895, Cl. 81-3.46R.
McFarland, Patricia A.: *See*—
McFarland, Robert C.; and McFarland, Patricia A., 4,456,823, Cl. 250-252.100.
McFarland, Robert C.; and McFarland, Patricia A. Mixed gamma emitting gas standard and method. 4,456,823, Cl. 250-252.100.
McGilvray, Bruce L.: *See*—
Bullions, Robert J., III; Curlee, Thomas O., III; Gum, Peter H.; McGilvray, Bruce L.; and Richardson, Ethel L., 4,456,954, Cl. 364-200.000.
McGinniss, Robert L., to Teledyne Industries, Inc. Hot workability of age hardenable nickel base alloys. 4,456,481, Cl. 75-82.000.
McKinnon, Crerand. Load-carrying trolleys. 4,456,273, Cl. 280-33.99H.
McKnight, Hugh P.; Welty, Kenneth B.; and Dinius, Harold B., to Eli Lilly and Company. Syringe inspection apparatus. 4,456,115, Cl. 198-377.000.
McLain, Philip A.: *See*—
LaValle, Dean R.; and McLain, Philip A., 4,456,132, Cl. 212-160.000.
McMillan, Stephen L.; and Cureton, Robert R., to General Electric Company. Self-cleaning under basket lint filter for automatic washers. 4,455,844, Cl. 68-18.00F.
McPherson, Malcolm J.; and Bellman, Robert A., to United States of America, Energy. Precision manometer gauge. 4,455,876, Cl. 73-747.000.
Mead Johnson & Company: *See*—
Temple, Davis L., Jr.; and Yeager, Richard E., 4,456,756, Cl. 544-364.000.
Medtronic, Inc.: *See*—
Lattin, Gary A., 4,456,012, Cl. 128-420.00R.
Phillips, Gary M.; and Untereker, Darrel F., 4,456,520, Cl. 204-291.000.
Mehaert, Walter; Kollner, Hans J.; and Tonnes, Helmut, to PEBRA GmbH Paul Braun. Cigar lighter. 4,456,817, Cl. 219-263.000.
Mehta, Atul, to Saurer-Allma GmbH. Apparatus for the manufacture of a fancy yarn. 4,455,817, Cl. 57-18.000.
Meitav, Azieh: *See*—
Peled, Emanuel; Meitav, Azieh; and Brand, Mordechai, 4,456,665, Cl. 429-105.000.
Melan, Corneille: *See*—
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Melcer, Henryk, to Sulzer Brothers Limited. Soot blower. 4,456,057, Cl. 165-95.000.
Melotik, Donald J.; Weintraub, Marvin H.; and Anderson, Arnold E., to Ford Motor Company. Friction material having a coating comprising alkanolamine-carboxylic acid salts. 4,456,650, Cl. 428-290.000.
Menendez, Juan Blas S. Apparatus for the separation of metallic zinc from residues containing zinc. 4,456,230, Cl. 266-143.000.
Menini, Joseph: *See*—
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Meniovich, Boris I.: *See*—
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Mennicken, Gerhard: *See*—
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Woltersdorf, Otto W., Jr., 4,456,599, Cl. 424-200.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
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Weber, Georg; Eidenschink, Rudolf; and Erdmann, Dietrich, 4,456,545, Cl. 252-299.100.
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Merlini, Luigi; Bassi, Aldo; and Satta, Giuseppe, to Alfa Romeo Auto S.p.A. Modular multi-cylinder internal combustion engine. 4,455,984, Cl. 123-481.000.
MERO-Raumstruktur GmbH & Co. Wurzburg: *See*—
Kornberger, Otto, 4,455,803, Cl. 52-395.000.
Merritt, W. R., to Canadian Patents & Development Limited. Light weight vault wall. 4,455,801, Cl. 52-309.900.
Merten, Gerhard; Breuer, Oswald; Hesse, Norbert; and Steinkuhl, Bernd, to Gewerkschaft Eisenhutte Westfalia. Cutter bit assembly. 4,456,307, Cl. 299-93.000.
Merten, Rudolf: *See*—
Rottmaier, Ludwig; Merten, Rudolf; Siebourg, Wolfgang; and Lachmann, Burkhard, 4,456,715, Cl. 524-100.000.
Meshberg, Philip. Trigger attachment for pumps. 4,456,153, Cl. 222-321.000.
Messelt, Christopher D.; and Townsend, Glenda P., to Dow Chemical Company, The. Multiple stage process for preparing mixed hydroxyalkylcellulose ethers. 4,456,751, Cl. 536-91.000.
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Doellinger, Rolf; and Schindler, Rudolf, 4,456,495, Cl. 156-166.000.
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Becker, Wilfried; Pepina, Oswald; and Landmann, Manfred, 4,455,944, Cl. 102-530.000.
Sepp, Gunther; and Dyrna, Peter, 4,457,001, Cl. 372-59.000.
Tijssen, Hartmut, 4,456,206, Cl. 244-118.500.
Messori, Pier P.; and Scapecchi, Pier L., to Fiat Auto S.p.A. Device for locking the inner ring of a rolling bearing on a rotary shaft. 4,456,314, Cl. 308-236.000.
Met Pro Corporation: *See*—
Keller, Joseph H.; and Baur, Fred G., 4,456,702, Cl. 502-314.000.
Metallwerk Max Brose GmbH & Co.: *See*—
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Metme Communications: *See*—
Bloy, Graham P., 4,457,014, Cl. 381-98.000.
Metra Electronics Corporation: *See*—
Badiali, John A., 4,456,289, Cl. 292-28.000.
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Micro Pure Systems, Inc.: *See*—
Abts, Leigh R., 4,455,873, Cl. 73-629.000.
Micron Corporation: *See*—
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Augustine, C. F., 4,456,911, Cl. 343-5.0PD.
Middlebrook, Terence C., to Phillips Petroleum Company. Phenol-formaldehyde resins as additives for solution-polymerized copolymers of conjugated alkadienes and vinyl arenes. 4,456,727, Cl. 524-511.000.
Mikhel, John L. Guiding unit for swimming pool cleaners. 4,455,695, Cl. 4-490.000.
Miki, Masayuki: *See*—
Sasayama, Takao; Amano, Matsuo; Hirayama, Takeshi; Sakamoto, Shinichi; and Miki, Masayuki, 4,455,960, Cl. 123-425.000.
Mikiya, Toshio; Shoji, Mitihiro; and Tanoi, Tadao, to Nitto Kohki Company, Limited. Stabilization device for the stand of a drilling machine. 4,456,410, Cl. 408-76.000.
Milba Properties Pty. Ltd.: *See*—
Hodson, Baden L., 4,456,095, Cl. 182-200.000.

Miles, Marshall, to Cordis Corporation. Coil spring guide with deflectable tip. 4,456,017, Cl. 128-772.000.
Milgram, Jerome H., to Massachusetts Institute of Technology. Oil collector for subsea blowouts. 4,456,071, Cl. 166-356.000.
Miller, Albert J., to Atlas Electronics International, Inc. Vehicle load monitoring system. 4,456,084, Cl. 177-141.000.
Miller, Claudette R. Memorial display case. 4,455,772, Cl. 40-124.500.
Miller, Jack E.: *See*—
Fowler, Joe R.; Hitchcock, Wilbur A.; and Miller, Jack E., 4,456,073, Cl. 166-367.000.
Miller, Richard F.; and Go, Ting S. L., to Atlantic Richfield Company. Method for minimizing fouling of heat exchangers. 4,456,526, Cl. 208-48.0AA.
Miller, Timothy I. High-speed tires. 4,456,046, Cl. 152-209.00R.
Milliken Research Corporation: *See*—
McCollough, John K.; and Pascoe, William M., Sr., 4,456,818, Cl. 219-373.000.
Minagawa, Shoichi; Okamoto, Takeshi; and Niitsuma, Teruo, to Clarion Company, Ltd. Surface acoustic wave device. 4,456,847, Cl. 310-313.00R.
Minatodani, Shohji: *See*—
Miyata, Hiroyasu; Ohkita, Masao; Itoh, Akinori; and Minatodani, Shohji, 4,456,155, Cl. 222-396.000.
Miner, David W.; Driscoll, Mark D.; Sorenson, John E.; Kirchner, Robert T.; and Keech, David A., to Armstrong International, Inc. Energy loss detection system. 4,456,173, Cl. 237-67.000.
Mingus, Joel A.: *See*—
Behle, Gunter R.; and Mingus, Joel A., 4,456,220, Cl. 251-144.000.
Minkus, Morton: *See*—
Drower, Herbert M.; and Minkus, Morton, 4,456,639, Cl. 428-13.000.
Minnesota Mining and Manufacturing Company: *See*—
Adamse, Jan W. C.; and Van Turnhout, Jan, 4,456,648, Cl. 428-283.000.
Chung, Chi H.; Lu, Sun; and Chung, David B., 4,456,336, Cl. 350-338.000.
Freerks, Conrad T., 4,455,788, Cl. 51-334.000.
Gerster, John F., 4,456,606, Cl. 424-258.000.
Van Aken Redinger, Peter; and Compton, Richard A., 4,455,691, Cl. 3-36.000.
Minolta Camera Kabushiki Kaisha: *See*—
Nakatani, Keiji; and Arakaki, Masaharu, 4,457,008, Cl. 377-18.000.
Misawa, Masayuki; and Yago, Hidetaka, to Kansai Paint Co. Ltd. Cationic electrophoretic coating process. 4,456,514, Cl. 204-181.00C.
Mita Industrial Co., Ltd.: *See*—
Shigemura, Yutaka; Hisajima, Masahiko; Kimura, Hiroshi; Yada, Isao; Irie, Yoichiro; Morimoto, Kiyoshi; and Nagashima, Takashi, 4,456,673, Cl. 430-125.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Asayama, Yoshiaki, 4,455,985, Cl. 123-494.000.
Kajiyama, Ryuichi, 4,456,096, Cl. 187-29.00R.
Komine, Yoshiharu; and Sawada, Takao, 4,456,902, Cl. 338-34.000.
Mizuno, Masanori; Kato, Yoshiaki; and Mizuno, Takaji, 4,456,813, Cl. 219-130.210.
Mizuno, Takaji; Shimizu, Takao; and Kato, Yoshiaki, 4,456,814, Cl. 219-137.710.
Ozaki, Hideyuki; and Fujishima, Kazuyasu, 4,456,939, Cl. 361-56.000.
Tachibana, Kouji, 4,456,842, Cl. 310-61.000.
Yamamoto, Sakuei; and Nishida, Mitsuhiro, 4,456,844, Cl. 310-87.000.
Mitsubishi Petrochemical Company Limited: *See*—
Nimura, Hitoshi; Kono, Makoto; and Yoshida, Shinichi, 4,456,695, Cl. 502-104.000.
Mitsui, Akio: *See*—
Ishikawa, Takatoshi; Mitsui, Akio; Morigaki, Masakazu; and Nakamura, Takashi, 4,456,682, Cl. 430-523.000.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Matsuda, Fujio; Kato, Takazo; and Kiyoura, Tadamitsu, 4,456,760, Cl. 548-508.000.
Mittmann, Bernd, to Webasto-Werk W. Baier GmbH & Co. Side channel blower. 4,456,423, Cl. 415-53.00R.
Miwa, Hiroaki: *See*—
Sudo, Ryoichi; Miwa, Hiroaki; and Watanabe, Takeshi, 4,456,659, Cl. 428-447.000.
Miyagi, Masahide: *See*—
Nishiura, Masaharu; Sakai, Hiroshi; Miyagi, Masahide; Uchida, Yoshiyuki; and Haruki, Hiromu, 4,456,782, Cl. 136-244.000.
Miyaji, Akira: *See*—
Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; Miyaji, Akira; and Mizunoe, Katsumi, 4,456,931, Cl. 358-335.000.
Miyasaka, Yoichi: *See*—
Inoue, Takeshi; and Miyasaka, Yoichi, 4,456,850, Cl. 310-324.000.
Miyashita, Shunitsu; Azuma, Masaaki; and Somemiya, Akiyoshi, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Method of manufacturing graft copolymers comprising polyphenylene ether. 4,456,736, Cl. 525-392.000.
Miyata, Hiroyasu; Ohkita, Masao; Itoh, Akinori; and Minatodani, Shohji, to Alps Electric Co., Ltd. Aerosol spray device. 4,456,155, Cl. 222-396.000.
Mizokami, Kazunori, to Olympus Optical Co., Ltd. Photometry controller for camera having an electronic flash controlling capability and capable of photometry of reflection from film surface. 4,456,353, Cl. 354-414.000.
Mizokami, Kazunori, to Olympus Optical Co., Ltd. Exposure controller for a camera. 4,456,354, Cl. 354-414.000.
Mizuma, Kenichi, to Ricoh Company, Ltd. Duplex tray for duplex copying machine and the like. 4,456,238, Cl. 271-3.100.
Mizuno, Masanori; Kato, Yoshiaki; and Mizuno, Takaji, to Mitsubishi Denki Kabushiki Kaisha. Hot wire type arc welding system. 4,456,813, Cl. 219-130.210.
Mizuno, Takaji; Shimizu, Takao; and Kato, Yoshiaki, to Mitsubishi Denki Kabushiki Kaisha. Arc welding apparatus including function generators for controlling welding parameters. 4,456,814, Cl. 219-137.710.
Mizuno, Takaji: *See*—
Mizuno, Masanori; Kato, Yoshiaki; and Mizuno, Takaji, 4,456,813, Cl. 219-130.210.
Mizunoe, Katsumi: *See*—
Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; Miyaji, Akira; and Mizunoe, Katsumi, 4,456,931, Cl. 358-335.000.
Mobil Oil Corporation: *See*—
Brundige, Virgil L., Jr., 4,456,459, Cl. 62-9.000.
Colombo, Edward A., 4,456,660, Cl. 428-516.000.
Cullick, Alvin S.; Mathis, Melwyn L.; and Warner, Bert J., 4,455,860, Cl. 73-19.000.
Johnson, David E., 4,456,571, Cl. 264-45.500.
Marsh, Susan K.; Owen, Hartley; and Wright, Bernard S., 4,456,781, Cl. 585-533.000.
Oleck, Stephen M.; and Sherry, Howard S., 4,456,700, Cl. 502-220.000.
Owen, Hartley; Marsh, Susan K.; and Wright, Bernard S., 4,456,779, Cl. 585-415.000.
Shim, Joosup, 4,456,539, Cl. 252-46.700.
Shu, Winston R., 4,456,066, Cl. 166-272.000.
Young, Lewis B., 4,456,780, Cl. 585-475.000.
Mogilevskoe Otdelenie Fizikotekhnicheskogo Instituta Akademii Nauk Beloruskoi SSR: *See*—
Shaturov, Gennady F.; and Malyavko, Sergei S., 4,456,407, Cl. 407-7.000.
Mohn, Hans-Werner, to Jagenberg AG. Turret comprising turntables for bottles in a bottle-handling machine, and more particularly a labeling machine. 4,456,114, Cl. 198-377.000.
Mohrman, Edward A.; Umeno, Tsunetaka; and Sato, Fumitaka, to Honeywell Information Systems Inc.; Nippon Electric Co., Ltd.; and Tokyo Shibaura Denki Kabushiki Kaisha. Data processing system having redundant control processors for fault detection. 4,456,952, Cl. 364-200.000.
Molnar, Csaba: *See*—
Toth, Jozsef; Hajos, Gyorgy; Fekete, Gyorgy; Horvath, Istvan; Szporny, Laszlo ; Boor nee Mezei, Anna; Aranyi, Peter; Naray, Aniko; Gorog, Sandor; Holly, Sandor; and Molnar, Csaba, 4,456,601, Cl. 424-241.000.
Monosolar, Inc.: *See*—
Basol, Bulent M., 4,456,630, Cl. 427-88.000.
Monsanto Company: *See*—
Wrobleski, James T., 4,456,764, Cl. 549-260.000.
Moran, Michael J.: *See*—
DeMarco, Ronald A.; and Moran, Michael J., 4,456,583, Cl. 423-277.000.
Morelli, John A.: *See*—
Pitcher, William E.; Baione, Peter W.; and Morelli, John A., 4,456,323, Cl. 339-177.00R.
Moretti, Anthony L., to E.D. Bullard Company. Self-adjusting protective garment. 4,455,683, Cl. 2-2.000.
Morgan Construction Company: *See*—
Salter, Lowell S., Jr.; Divirgilio, Ralph F.; and Brickey, Russell A., 4,455,856, Cl. 72-236.000.
Morgan, David C.: *See*—
Bieler, Barrie H.; Morgan, David C.; and Stringham, Robert R., 4,456,512, Cl. 204-162.00R.
Morgan, Howard W. Filtration bag remover. 4,455,731, Cl. 29-280.000.
Morigaki, Masakazu: *See*—
Ishikawa, Takatoshi; Mitsui, Akio; Morigaki, Masakazu; and Nakamura, Takashi, 4,456,682, Cl. 430-523.000.
Moriguchi, Haruhiko: *See*—
Kikuchi, Yoshiki; Ohmori, Takashi; Moriguchi, Haruhiko; and Nakajima, Hisao, 4,456,824, Cl. 250-318.000.
Morimoto, Kiyoshi: *See*—
Shigemura, Yutaka; Hisajima, Masahiko; Kimura, Hiroshi; Yada, Isao; Irie, Yoichiro; Morimoto, Kiyoshi; and Nagashima, Takashi, 4,456,673, Cl. 430-125.000.
Morin, George A. Apparatus for shingling stack of flat articles. 4,456,242, Cl. 271-94.000.
Morin, Marius J.: *See*—
Buck, Keith E.; Chase, Irving C.; and Morin, Marius J., 4,456,014, Cl. 128-719.000.
Morin, Pierre; and Thirion, Christian, to USM Corporation. Automatic sewing machine. 4,455,952, Cl. 112-121.120.
Morita, Tamao. Stopper using a magnet. 4,455,719, Cl. 24-303.000.
Morita, Yoshihisa: *See*—
Gomi, Yoshifumi; Matsuzawa, Masanao; Ikeda, Yoshito; and Morita, Yoshihisa, 4,456,393, Cl. 400-124.000.
Morley, Richard M.; Multani, Jagir S.; and Sandhu, J. S., to General Instrument Corp. Electrically alterable read only memory semiconductor device made by low pressure chemical vapor deposition process. 4,456,978, Cl. 365-184.000.

Morroll, Terence D.; and Straw, David A., to Plessey Overseas Limited. Remote switch monitoring circuit for mining. 4,456,908, Cl. 340-644.000.

Mortimer, Ivan; Farr, Glyn P. R.; and Yardley, Alfred, to Lucas Industries Limited. Hydraulic actuator for a vehicle internal shoe-drum brake. 4,456,104, Cl. 188-349.000.

Moser, Keith W.: *See*—
Witwer, Keith A.; Moser, Keith W.; and Sanderson, Richard A., 4,455,743, Cl. 29-596.000.

Moss, Gaylord E.: *See*—
Arns, James A.; Edwards, Timothy J.; Moss, Gaylord E.; and Wreede, John E., 4,456,328, Cl. 350-3.600.

Moto Laverda S.p.A.: *See*—
Malenotti, Franco, 4,456,090, Cl. 180-219.000.

Motorola, Inc.: *See*—
Burke, Timothy M.; and Noble, Scott W., 4,457,005, Cl. 375-82.000.
Dydyk, Michael, 4,457,022, Cl. 455-317.000.
Mason, Daniel W.; and Stevenson, David W., 4,456,828, Cl. 250-551.000.
Reed, Francis K., 4,457,003, Cl. 375-1.000.
Wu, Schyi-Yi, 4,456,489, Cl. 148-1.500.

Mouzin, Gilbert; Cousse, Henri; and Vilain, Pol, to Pierre Fabre S.A. 3-Amino-1-[(1,4-benzodioxan)-2-yl-methoxy]-2-propanols, pharmaceutical compositions thereof, and their use as medicaments. 4,456,614, Cl. 424-278.000.

MTD Products Inc.: *See*—
Hauser, Hans, 4,455,889, Cl. 74-713.000.

Muchowski, Joseph M.; and Greenhouse, Robert, to Syntex (U.S.A.) Inc. 5-Benzoyl-7-halo-1,2-dihydro-3H-pyrrolo-[1,2-a]pyrrole-1,1-dicarboxylic acids and esters thereof. 4,456,759, Cl. 548-453.000.

Mueller, Gerald E.: *See*—
Kern, Leon O.; Zeilinger, James G.; and Mueller, Gerald E., 4,456,271, Cl. 279-91.000.

Muller, Anton, to Elsen- und Drahtwerk Erlau Aktiengesellschaft. Tensioning device for chains. 4,456,233, Cl. 267-70.000.

Muller, Frank: *See*—
Schmid, Wolfgang; Wanner, Karl; Falchle, Jorg; Bleicher, Manfred; and Muller, Frank, 4,456,076, Cl. 173-116.000.

Muller, Hanns P.: *See*—
Richter, Roland; Hettel, Hans; and Muller, Hanns P., 4,456,709, Cl. 521-160.000.

Muller, Karl-Heinz: *See*—
Krade, Werner; Muller, Karl-Heinz; and Riemscheid, Helmut, 4,456,269, Cl. 277-212.0FB.

Muller, Richard, to Pfaff Industriemaschinen GmbH. Air cylinder with end position damping. 4,455,923, Cl. 91-394.000.

Multani, Jagir S.: *See*—
Morley, Richard M.; Multani, Jagir S.; and Sandhu, J. S., 4,456,978, Cl. 365-184.000.

Mumford, Robin B., to Allied Corporation. Thermal-pane window with liquid crystal shade. 4,456,335, Cl. 350-331.00R.

Munzel, Klaus, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG. Impact fuze with flight time-dependent detonation delay. 4,455,939, Cl. 102-215.000.

Murakami, Katsumi: *See*—
Komiya, Yutaka; Murakami, Katsumi; Inuzuka, Tsuneki; and Sakamaki, Hisashi, 4,456,366, Cl. 355-8.000.

Murakami, Katsushi, to Kabushiki Kaisha Bandai. Toy robot having timepiece on torso thereof. 4,456,384, Cl. 368-10.000.

Murakami, Katsuyuki; Hirakata, Kaoru; Ishizaka, Fumio; Shimoda, Shinichi; and Itai, Reiichi, to Japan Carlit Co., Ltd., The. Process for manufacturing chlorine dioxide. 4,456,510, Cl. 204-101.000.

Murakami, Masahiro; Kobayashi, Masateru; Yamamoto, Kimiyo; and Shibuya, Chisei, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for the preparation of cephalosporin derivatives using thioesters. 4,456,754, Cl. 544-21.000.

Muranaka, Yasushi: *See*—
Akimoto, Hidetoshi; Kaji, Ryuichi; Komuro, Takeo; Muranaka, Yasushi; Kikuchi, Hideo; Hishinuma, Yukio; Nakajima, Fumito; and Terada, Hiroshi, 4,456,528, Cl. 209-49.000.

Murase, Masakazu: *See*—
Hirano, Toshinori; and Murase, Masakazu, 4,456,959, Cl. 364-417.000.

Murata Kikai Kabushiki Kaisha: *See*—
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,456,188, Cl. 242-35.50R.

Murata, Minoru; and Kawanabe, Tsuyoshi, to Canon Kabushiki Kaisha. Printing device. 4,455,937, Cl. 101-93.150.

Murata, Shinji: *See*—
Hakoi, Tsutomu; and Murata, Shinji, 4,455,879, Cl. 73-862.010.

Murdock, Keith C.; and Durr, Frederick E., to American Cyanamid Company. 1,4-Bis(substituted-amino)-5,8-dihydroxyanthraquinones and leuco bases thereof. 4,456,552, Cl. 260-377.000.

Murray, John; and Tobias, Robert W., to Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, The. Training ammunition. 4,455,942, Cl. 102-444.000.

Muryoi, Takeshi, to Nippon Kogaku K.K. Zoom lens barrel capable of close up photography. 4,456,342, Cl. 350-430.000.

Muscat, Gerard, to Societe Anonyme DBA. Drum brake with automatic recentering of the shoes. 4,456,103, Cl. 188-326.000.

Muscular Dystrophy Association of Canada, The: *See*—
Allard, Paul L.; and Sibille, Jacques R., 4,456,003, Cl. 128-80.00F.

Musha, Shuji: *See*—
Matsuda, Yasuo; Honda, Kazuo; Fukui, Hiroshi; Amano, Hisao; and Musha, Shuji, 4,456,836, Cl. 307-252.00C.

Myers, Lawrence R.: *See*—
Gaiser, Robert F.; Lohraff, Larry G.; and Myers, Lawrence R., 4,455,830, Cl. 60-562.000.
Gaiser, Robert F.; Lohraff, Larry G.; and Myers, Lawrence R., 4,455,832, Cl. 60-581.000.

Nabisco Brands, Inc.: *See*—
Maselli, John A.; and Horwath, Robert O., 4,456,622, Cl. 426-17.000.

Nagafuji, Motonobu: *See*—
Yanagita, Tomoatsu; and Nagafuji, Motonobu, 4,456,955, Cl. 364-200.000.

Nagahara, Toshio: *See*—
Junichi, Kita; and Nagahara, Toshio, 4,455,838, Cl. 60-711.000.

Nagano, Toshiaki, to Shinsei Kogyo Co., Ltd. Toy locomotive. 4,455,783, Cl. 446-71.000.

Nagao, Nobuya: *See*—
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,456,838, Cl. 307-264.000.

Nagashima, Masasumi: *See*—
Nozaki, Mineo; Asakura, Osamu; Nagashima, Masasumi; and Iwakura, Sadao, 4,456,392, Cl. 400-120.000.

Nagashima, Takashi: *See*—
Shigemura, Yutaka; Hisajima, Masahiko; Kimura, Hiroshi; Yada, Isao; Irie, Yoichiro; Morimoto, Kiyoshi; and Nagashima, Takashi, 4,456,673, Cl. 430-125.000.

Nagata, Kazuo: *See*—
Nakao, Shinroku; Ishii, Yoshiyasu; and Nagata, Kazuo, 4,456,007, Cl. 128-200.210.

Naito, Shiro: *See*—
Yoshioka, Teruo; Naito, Shiro; Abe, Yuzo; and Uchida, Kuninobu, 4,455,734, Cl. 29-434.000.

Naka, Hiromitsu, to Kabushiki Kaisha Naka Gijutsu Kenkyusho. Stair nosing. 4,455,797, Cl. 52-179.000.

Nakagawa, Isao; Kondo, Kazuo; and Kudo, Mitsuru, to Hitachi, Ltd. Filter circuit suitable for being fabricated into integrated circuit. 4,456,885, Cl. 330-107.000.

Nakagawa, Kazuhiko: *See*—
Inoue, Kimio; Fukui, Tsugushi; Asai, Toshihiro; Nakagawa, Kazuhiko; and Kuriyama, Akimasa, 4,456,381, Cl. 366-97.000.

Nakagawa, Sadayoshi; and Shinohara, Mitsuharu, to Hosiden Electronics Co., Ltd. Unidirectional electret microphone. 4,456,796, Cl. 179-111.00E.

Nakagome, Yukio; Ogawa, Akira; Hirata, Yasuo; and Takahashi, Toshio, to Kokusai Denshin Denwa Kabushiki Kaisha. Satellite repeater. 4,456,988, Cl. 370-75.000.

Nakajima, Fumito: *See*—
Akimoto, Hidetoshi; Kaji, Ryuichi; Komuro, Takeo; Muranaka, Yasushi; Kikuchi, Hideo; Hishinuma, Yukio; Nakajima, Fumito; and Terada, Hiroshi, 4,456,528, Cl. 209-49.000.

Nakajima, Hidemasa: *See*—
Masuda, Seiichi; Matsuo, Tohru; Ohkita, Yoshimichi; Aoki, Takeo; Nakajima, Hidemasa; Okamura, Shozo; Hirata, Takeyuki; and Anezaki, Shoji, 4,456,477, Cl. 75-51.000.

Nakajima, Hisao: *See*—
Kikuchi, Yoshiki; Ohmori, Takashi; Moriguchi, Haruhiko; and Nakajima, Hisao, 4,456,824, Cl. 250-318.000.

Nakajima, Kenji: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,456,558, Cl. 260-413.000.

Nakajima, Masao: *See*—
Kanegae, Hidetoshi; Kawamura, Yoshihisa; Nakajima, Masao; and Yasuhara, Seishi, 4,456,831, Cl. 290-38.00R.

Nakamura, Shohei; and Tuji, Yoshimasa, to Asahi Kasei Kogyo Kabushiki Kaisha. Process for preparing a mask for sandblasting. 4,456,680, Cl. 430-258.000.

Nakamura, Takashi: *See*—
Ishikawa, Takatoshi; Mitsui, Akio; Morigaki, Masakazu; and Nakamura, Takashi, 4,456,682, Cl. 430-523.000.

Nakamura, Toshihiko: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,456,558, Cl. 260-413.000.

Nakane, Masami; Snitman, David L.; Reid, Joyce; and Haslanger, Martin F., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane substituted amino prostaglandin analogs and their use in inhibiting platelet aggregation and bronchoconstriction. 4,456,615, Cl. 424-285.000.

Nakane, Masami; and Haslanger, Martin F., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane substituted amino prostaglandin analogs and their use in inhibiting platelet aggregation and bronchoconstriction. 4,456,617, Cl. 424-285.000.

Nakane, Masami: *See*—
YHaslanger, Martin F.; Nakane, Masami; and Hall, Steven E., 4,456,616, Cl. 424-285.000.

Nakanowatari, Jun: *See*—
Kano, Mitsuru; Nakanowatari, Jun; and Kamijyo, Yoshimi, 4,456,549, Cl. 252-518.000.

Nakao, Shinroku; Ishii, Yoshiyasu; and Nagata, Kazuo, to Combi Co., Ltd. Inhaler. 4,456,007, Cl. 128-200.210.

Nakao, Sho: *See*—
Nakayama, Takao; Ohishi, Chikashi; Nakao, Sho; and Shiba, Keisuke, 4,456,670, Cl. 430-49.000.

Nakatani, Keiji; and Arakaki, Masaharu, to Minolta Camera Kabushiki Kaisha. Automatic retrieval apparatus. 4,457,008, Cl. 377-18.000.

Nakayama, Takao; Ohishi, Chikashi; Nakao, Sho; and Shiba, Keisuke, to Fuji Photo Film Co., Ltd. Photosensitive material for lithographic printing. 4,456,670, Cl. 430-49.000.
Nakhla, Michael S.: *See*—
Carsten, Ralph T.; Nakhla, Michael S.; and Bunner, Charles B. D., 4,456,985, Cl. 370-30.000.
Carsten, Ralph T.; Nakhla, Michael S.; and Bunner, Charles B. D., 4,456,986, Cl. 370-30.000.
Nalco Chemical Company: *See*—
Albanese, Vincent M.; and Keleher, Andrew G., 4,456,635, Cl. 427-230.000.
Nally, Robert B.; Akister, James F.; Leung, Patrick C.; and Vance, Eric J., to NCR Corporation. Matrix character preprocessing system. 4,457,015, Cl. 382-45.000.
Nambu, Junji; Yoshino, Kenji; Ariga, Nagao; Shimazu, Kyotaro; and Sato, Hiroyuki, to Dainippon Ink and Chemicals, Inc. Thermoplastic resin composition having improved weld strength. 4,456,732, Cl. 525-65.000.
Namsick, Raymond J.: *See*—
Suter, Charles A.; and Namsick, Raymond J., 4,456,496, Cl. 156-249.000.
Nania, Franco. Prefabricated building block and civil building composed of a plurality of such blocks assembled together. 4,455,793, Cl. 52-91.000.
Naray, Aniko: *See*—
Toth, Jozsef; Hajos, Gyorgy; Fekete, Gyorgy; Horvath, Istvan; Szporny, Laszlo ; Boor nee Mezei, Anna; Aranyi, Peter; Naray, Aniko; Gorog, Sandor; Holly, Sandor; and Molnar, Csaba, 4,456,601, Cl. 424-241.000.
Narducy, Kenneth W.: *See*—
Arbir, Francis W.; Raden, Daniel S.; Narducy, Kenneth W.; and Casati, Francois M., 4,456,696, Cl. 502-167.000.
Narumi China Corporation: *See*—
Ohtani, Hiroshi, 4,456,641, Cl. 428-35.000.
Naslund, Leif, to Handelsbolaget Ornell-Teknik. Electronic transmitter element and a lifting device comprising such element. 4,455,880, Cl. 73-862.560.
Nasu, Hiroshi, to Hiraoka Kogyo Kabushiki Kaisha. Embroidery lace machine driven by electric signals. 4,455,951, Cl. 112-84.000.
Nautilus Sports/Medical Industries, Inc.: *See*—
Baldwin, Dan D., 4,456,245, Cl. 272-118.000.
NCR Corporation: *See*—
Nally, Robert B.; Akister, James F.; Leung, Patrick C.; and Vance, Eric J., 4,457,015, Cl. 382-45.000.
Schieltz, Steven W., 4,456,957, Cl. 364-200.000.
Neboga, Vladimir A.: *See*—
Mamrosov, Alexandr D.; Fedulov, Oleg V.; Kolivashko, Alexandr S.; Meniovich, Boris I.; and Neboga, Vladimir A., 4,456,175, Cl. 239-113.000.
Neenan, John S. Adjustable pulse jet. 4,456,174, Cl. 239-8.000.
Neier, Wilhelm; Webers, Werner; and Ostwald, Wolf, to Deutsche Texaco Aktiengesellschaft. Process for the production of a lower aliphatic alcohol. 4,456,776, Cl. 568-899.000.
Neiheisel, Gary L.; and Schoen, Jerry W., to Armco Inc. Laser treatment of electrical steel. 4,456,812, Cl. 219-121.0LM.
Neil, Jeffrey T.: *See*—
French, Kenneth W.; Neil, Jeffrey T.; and Turnbaugh, Larry L., 4,456,713, Cl. 523-455.000.
Nelson, Keith F.: *See*—
El-Gohary, Hussein T.; Vaillette, Gary P.; and Nelson, Keith F., 4,456,956, Cl. 364-200.000.
Nelson, Kenneth W.; Woo, Ricky A.; Palumbo, Patrick D.; and Collins, Michael L., to Procter & Gamble Company, The. New shortening system. 4,456,626, Cl. 426-553.000.
Nelson, Wendy J.: *See*—
Rao, Purushothama; and Nelson, Wendy J., 4,456,579, Cl. 420-566.000.
Neste Oy: *See*—
Mandell, Leo; Eklund, Vidar; Ekman, Kurt; Huttunen, Jouko; and Turunen, Olli, 4,456,749, Cl. 536-30.000.
Netherwood, Shelley: *See*—
Blackwell, Bernie; Netherwood, Shelley; and Piccolo, Dominick J., 4,456,621, Cl. 426-3.000.
Netzhammer, Peter, to SIG - Schweizerische Industrie-Gesellschaft. Sealing shoe assembly. 4,455,808, Cl. 53-373.000.
Neumann, Peter: *See*—
Eilingsfeld, Heinz; Etzbach, Karl-Heinz; Hoffmann, Gerhard; and Neumann, Peter, 4,456,672, Cl. 430-59.000.
Neveux, Francis H.: *See*—
Alavoine, Jacques J.; Contensou, Claude; Hardy, Pierre M.; and Neveux, Francis H., 4,456,205, Cl. 244-110.00C.
New, Nigel H., to AEPLC. Tilting pad thrust bearing. 4,456,391, Cl. 384-307.000.
Newhard, Robert H. Car carrier having a sliding and tilting platform. 4,456,420, Cl. 414-478.000.
Newman, Alec T.; Rhodes, David; and Edge, Brian A., to General Foods Limited. Movable selection carrier. 4,456,148, Cl. 221-132.000.
Newman, James L. Hydraulic drilling jar. 4,456,081, Cl. 175-297.000.
Newport, James B.: *See*—
Greer, Richard H.; and Newport, James B., 4,456,832, Cl. 307-38.000.
Newsome, John R. Sucker type card feeder. 4,456,241, Cl. 271-11.000.
NGK Spark Plug Co., Ltd.: *See*—
Toyoshima, Yohtaro; Sasaki, Yasuhiro; and Uchida, Minoru, 4,456,900, Cl. 336-221.000.
Nguyen, Linh V.: *See*—
Terhune, Robert D.; Bazin, George L., II; Long, James H.; and Nguyen, Linh V., 4,455,761, Cl. 34-14.000.
NHK Spring Co., Ltd.: *See*—
Kurahayashi, Takahisa; and Ojima, Juji, 4,456,437, Cl. 417-368.000.
Shinbori, Takeyoshi; and Matsuoka, Susumu, 4,456,232, Cl. 267-54.00B.
Niagara Machine & Tool Works: *See*—
Jones, Clarence O., Jr., 4,456,112, Cl. 192-150.000.
Nichiden Koshuha Kabushiki Kaisha: *See*—
Kaneda, Fumio; and Maeike, Tadahiro, 4,456,803, Cl. 219-8.500.
Nichol, Thomas J.; and McCunn, Thomas H., to Allegheny Ludlum Steel Corporation. Ferritic stainless steel. 4,456,482, Cl. 75-126.00C.
Nicholson, Margie M., to Rockwell International Corporation. Chemically coupled color-changing display. 4,456,337, Cl. 350-357.000.
Nicoll, Robert A.: *See*—
Evans, Dennis C.; Nicoll, Robert A.; and Gladden, Robert E., 4,456,427, Cl. 416-95.000.
Niitsuma, Teruo: *See*—
Minagawa, Shoichi; Okamoto, Takeshi; and Niitsuma, Teruo, 4,456,847, Cl. 310-313.00R.
Nimura, Hitoshi; Kono, Makoto; and Yoshida, Shinichi, to Mitsubishi Petrochemical Company Limited. Component of catalyst for olefin polymerization. 4,456,695, Cl. 502-104.000.
Ninomiya, Masakazu: *See*—
Suzuki, Atsushi; Kawashima, Yutaka; and Ninomiya, Masakazu, 4,455,981, Cl. 123-438.000.
Nippon Electric Co., Ltd.: *See*—
Hayashi, Mineo, 4,456,977, Cl. 365-51.000.
Inoue, Takeshi; and Miyasaka, Yoichi, 4,456,850, Cl. 310-324.000.
Mohrman, Edward A.; Umeno, Tsunetaka; and Sato, Fumitaka, 4,456,952, Cl. 364-200.000.
Otani, Susumu, 4,456,893, Cl. 333-18.000.
Shibata, Sueji; and Umesato, Shoji, 4,456,318, Cl. 339-17.0CF.
Takayama, Yoshikazu, 4,457,018, Cl. 455-33.000.
Nippon Gakki Seizo Kabushiki Kaisha: *See*—
Yamada, Shigeru, 4,455,911, Cl. 84-1.190.
Nippon Kogaku K. K.: *See*—
Okabe, Nobuo, 4,456,356, Cl. 354-195.130.
Nippon Kogaku K.K.: *See*—
Muryoi, Takeshi, 4,456,342, Cl. 350-430.000.
Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; Miyaji, Akira; and Mizunoe, Katsumi, 4,456,931, Cl. 358-335.000.
Nippon Kokan Kabushiki Kaisha: *See*—
Kaneda, Fumio; and Maeike, Tadahiro, 4,456,803, Cl. 219-8.500.
Nippon Mektron Ltd.: *See*—
Iwai, Shoichiro; and Kameda, Eiichi, 4,456,798, Cl. 200-5.00A.
Nippon Soken, Inc.: *See*—
Nozawa, Masaei; Kamiya, Shigeru; and Yoshida, Hitoshi, 4,456,457, Cl. 55-283.000.
Yasuda, Eturo; Akita, Shigeyuki; and Kodera, Masao, 4,456,848, Cl. 310-322.000.
Nippon Steel Corporation: *See*—
Uchida, Shigeru; Watanabe, Kazuo; Ozawa, Kousaku; and Kawaharada, Minoru, 4,455,849, Cl. 72-41.000.
Nippon Telegraph & Telephone Public Corporation: *See*—
Yamada, Junzo; Mano, Tsuneo; and Inoue, Junichi, 4,456,980, Cl. 365-200.000.
Nippon Tenshashi Kabushiki Kaisha: *See*—
Ibata, Sachiko, 4,456,500, Cl. 156-634.000.
Nippondenso Co., Ltd.: *See*—
Suzuki, Atsushi; Kawashima, Yutaka; and Ninomiya, Masakazu, 4,455,981, Cl. 123-438.000.
Yoshimi, Akiro; Kamiya, Michihiko; Kojima, Yasuhumi; Ootsuka, Fumio; and Matsushima, Takeo, 4,456,055, Cl. 165-12.000.
Nishida, Mitsuhiro: *See*—
Yamamoto, Sakuei; and Nishida, Mitsuhiro, 4,456,844, Cl. 310-87.000.
Nishida, Shoji: *See*—
Yoshikawa, Tadao; and Nishida, Shoji, 4,456,304, Cl. 299-33.000.
Nishihara, Tadashi, to Nissan Motor Company, Ltd. Automotive instrument panel pad. 4,456,640, Cl. 428-31.000.
Nishikawa, Osamu: *See*—
Oshida, Jun-ichi; Nishikawa, Osamu; Tsuruta, Hideki; Takeshita, Toru; Yamamoto, Itaru; and Ishimaru, Kenji, 4,456,553, Cl. 260-397.200.
Nishiki, Tetsuya; and Kamide, Takao, to Kabushiki Kaisha Komatsu Seisakusho. Unmanned vehicle travel control device. 4,456,088, Cl. 180-168.000.
Nishimoto, Yoshiharu; and Yamazaki, Kengo, to Kureha Kagaku Kogyo Kabushiki Kaisha. Laminate film having a heat-shrinkage rate greater than 15 percent at 90° C. 4,456,646, Cl. 428-216.000.
Nishimura, Hitoshi: *See*—
Ogino, Yoshio; Kobayashi, Takao; Tsuda, Yuji; and Nishimura, Hitoshi, 4,456,807, Cl. 219-10.770.
Nishino, Kenichi: *See*—
Kamatani, Yoshio; Tanaka, Michio; Yamazaki, Kyuya; and Nishino, Kenichi, 4,456,744, Cl. 528-71.000.
Nishioka, Akira; Kawanabe, Yoshihiro; Fujimoto, Hideki; and Takahori, Hiroyuki, to Pioneer Electronic Corporation. Control circuit for voltage controlled variable attenuator. 4,456,886, Cl. 330-254.000.
Nishiura, Masaharu; Sakai, Hiroshi; Miyagi, Masahide; Uchida, Yoshiyuki; and Haruki, Hiromu, to Fuji Electric Co., Ltd. Solar cell device. 4,456,782, Cl. 136-244.000.

Nishiyama, Taichiro: *See*—
Kondo, Takashi; Takagi, Kiyotaka; and Nishiyama, Taichiro, 4,456,380, Cl. 356-418.000.
Niskanen, Heikki: *See*—
Karttunen, Martti; Niskanen, Heikki; and Oinonen, Hannu, 4,456,190, Cl. 242-56.00R.
Nissan Motor Co., Ltd.: *See*—
Aikawa, Hiroshi, 4,456,274, Cl. 280-96.100.
Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, 4,455,989, Cl. 123-620.000.
Fukushima, Masao; and Yazaki, Komei, 4,456,213, Cl. 248-559.000.
Kanegae, Hidetoshi; Kawamura, Yoshihisa; Nakajima, Masao; and Yasuhara, Seishi, 4,456,831, Cl. 290-38.00R.
Kawakami, Yasushi, 4,455,972, Cl. 123-41.740.
Kishi, Norimasa; Sasanuma, Kiyoshi; Takeuchi, Yasuhisa; and Kato, Shinichi, 4,456,903, Cl. 340-54.000.
Kita, Toru, 4,455,878, Cl. 73-861.220.
Kubozuka, Takao; Ogawa, Naoki; and Yamaguchi, Hideya, 4,456,092, Cl. 181-290.000.
Nishihara, Tadashi, 4,456,640, Cl. 428-31.000.
Takada, Juichiro; Ueno, Shuichi; and Isamu, Kazuo, 4,456,196, Cl. 242-107.600.
Takeuchi, Kiyoshi, 4,455,862, Cl. 73-35.000.
Nitanda, Hiroshi: *See*—
Masaki, Nobuo; Tokuda, Hiroyuki; Furukawa, Yoshiki; Sakurai, Mitsuru; and Nitanda, Hiroshi, 4,456,362, Cl. 355-3.00R.
Nitschko, Theodor; and Spitaler, Engelbert, to TMC Corporation. Heel holder. 4,456,281, Cl. 280-628.000.
Nitto Electric Industrial Co., Ltd.: *See*—
Konishi, Toshiharu; Honda, Zenzo; Hori, Yutaka; Shimizu, Yukio; and Okada, Hideyuki, 4,456,652, Cl. 428-344.000.
Nitto Kohki Company, Limited: *See*—
Mikiya, Toshio; Shoji, Mitihiro; and Tanoi, Tadao, 4,456,410, Cl. 408-76.000.
Noble, Scott W.: *See*—
Burke, Timothy M.; and Noble, Scott W., 4,457,005, Cl. 375-82.000.
Noda, Hideo, to Shimano Industrial Company Limited. Fishing reel with control lever guard. 4,456,194, Cl. 242-84.20A.
Noda, Koshi: *See*—
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, 4,456,188, Cl. 242-35.50R.
Nodelman, Joel R.: *See*—
Clark, Reginald H.; and Nodelman, Joel R., 4,455,881, Cl. 73-863.210.
Nooman, John Gerrad: *See*—
Brown, Maurice L., 4,455,979, Cl. 123-407.000.
Nordson Corporation: *See*—
Lewellen, Richard R., 4,456,151, Cl. 222-146.0HE.
North American Philips Corporation: *See*—
Goldowsky, Michael P.; and Kolbinger, Herman J., 4,456,378, Cl. 356-373.000.
Northcote, Reginald D., to Thorn Emi Energy Developments, Limited. Boilers. 4,455,968, Cl. 122-4.00D.
Northern Telecom Limited: *See*—
Carsten, Ralph T.; Nakhla, Michael S.; and Bunner, Charles B. D., 4,456,985, Cl. 370-30.000.
Carsten, Ralph T.; Nakhla, Michael S.; and Bunner, Charles B. D., 4,456,986, Cl. 370-30.000.
Northland Aluminum Products, Inc.: *See*—
Jorgensen, Jorgen A.; and Nygren, Donald W., 4,456,805, Cl. 219-10.55F.
Notenboom, Leo J., to Genie Industries, Inc. Dual-handled winch. 4,456,227, Cl. 254-350.000.
Nowacki, Christopher; and Brisson, Alfred S., to Trutek Research, Inc. Inhalation valve. 4,456,016, Cl. 128-725.000.
Nozaki, Mineo; Asakura, Osamu; Nagashima, Masasumi; and Iwakura, Sadao, to Canon Kabushiki Kaisha. Heat transfer printer. 4,456,392, Cl. 400-120.000.
Nozawa, Masaei; Kamiya, Shigeru; and Yoshida, Hitoshi, to Nippon Soken, Inc. Exhaust gas cleaning device for diesel engine. 4,456,457, Cl. 55-283.000.
Nujack Oil Pump Corporation: *See*—
Stanton, George E., 4,456,060, Cl. 166-68.500.
Nunn, Timothy A.: *See*—
Kurtz, Anthony D.; Nunn, Timothy A.; and Mallon, Joseph R., 4,456,901, Cl. 338-4.000.
Nygren, Donald W.: *See*—
Jorgensen, Jorgen A.; and Nygren, Donald W., 4,456,805, Cl. 219-10.55F.
Oblack, Steven M.: *See*—
Wood, Thomas G.; and Oblack, Steven M., 4,456,629, Cl. 427-3.000.
O'Brien, Charles B.: *See*—
Elko, George A.; and O'Brien, Charles B., 4,455,791, Cl. 52-12.000.
O'Brien, Daniel J., Jr., to Pfizer Inc. Process for the manufacture of highly crystalline sodium cefoperazone. 4,456,753, Cl. 544-20.000.
Occidental Chemical Corporation: *See*—
Bommaraju, Tilak V., 4,456,518, Cl. 204-290.00F.
Oda, Kiyoshi, to Yoshida Kogyo K. K. Slider for slide fastener. 4,455,722, Cl. 24-427.000.
Odaka, Kentaro, to Sony Corporation. Method and apparatus for encoding binary data. 4,456,905. Cl. 340-347.0DD.
Oemb SA: *See*—
Rossi, Piergiorgio, 4,456,036, Cl. 140-105.000.
Ogawa, Akira: *See*—
Nakagome, Yukio; Ogawa, Akira; Hirata, Yasuo; and Takahashi, Toshio, 4,456,988, Cl. 370-75.000.
Ogawa, Naoki: *See*—
Kubozuka, Takao; Ogawa, Naoki; and Yamaguchi, Hideya, 4,456,092, Cl. 181-290.000.
Oger, Jacques: *See*—
Freis, Jean L.; Hauer, Jean C.; and Oger, Jacques, 4,456,397, Cl. 404-25.000.
Ogihara, Yutaka: *See*—
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,456,838, Cl. 307-264.000.
Ogilvey, Graham Arthur: *See*—
Brown, Maurice L., 4,455,979, Cl. 123-407.000.
Ogino, Yoshio; Kobayashi, Takao; Tsuda, Yuji; and Nishimura, Hitoshi, to Matsushita Electric Industrial Co., Ltd. Induction heating cooking appliance. 4,456,807, Cl. 219-10.770.
Ohashi, Hideki: *See*—
Yamada, Takeshi; Ohashi, Hideki; and Tanimoto, Masahiro, 4,456,580, Cl. 422-63.000.
Ohba, Shinya: *See*—
Aoki, Masakazu; Ando, Haruhisa; Ohba, Shinya; and Takemoto, Iwao, 4,456,929, Cl. 358-213.000.
Ohio State University, The: *See*—
Dugan, Patrick R.; and Apel, William A., 4,456,688, Cl. 435-267.000.
Ohishi, Chikashi: *See*—
Nakayama, Takao; Ohishi, Chikashi; Nakao, Sho; and Shiba, Keisuke, 4,456,670, Cl. 430-49.000.
Ohkita, Masao: *See*—
Miyata, Hiroyasu; Ohkita, Masao; Itoh, Akinori; and Minatodani, Shohji, 4,456,155, Cl. 222-396.000.
Ohkita, Yoshimichi: *See*—
Masuda, Seiichi; Matsuo, Tohru; Ohkita, Yoshimichi; Aoki, Takeo; Nakajima, Hidemasa; Okamura, Shozo; Hirata, Takeyuki; and Anezaki, Shoji, 4,456,477, Cl. 75-51.000.
Ohmori, Takashi: *See*—
Kikuchi, Yoshiki; Ohmori, Takashi; Moriguchi, Haruhiko; and Nakajima, Hisao, 4,456,824, Cl. 250-318.000.
Ohtani, Hiroshi, to Narumi China Corporation. Ceramic substrate for semiconductor package. 4,456,641, Cl. 428-35.000.
Oinonen, Hannu: *See*—
Karttunen, Martti; Niskanen, Heikki; and Oinonen, Hannu, 4,456,190, Cl. 242-56.00R.
Ojima, Juji: *See*—
Kurahayashi, Takahisa; and Ojima, Juji, 4,456,437, Cl. 417-368.000.
Okabe, Nobuo, to Nippon Kogaku K. K. Focus adjusting device of a camera. 4,456,356, Cl. 354-195.130.
Okada, Hideyuki: *See*—
Konishi, Toshiharu; Honda, Zenzo; Hori, Yutaka; Shimizu, Yukio; and Okada, Hideyuki, 4,456,652, Cl. 428-344.000.
Okajima, Hidekazu: *See*—
Hirata, Noritsugu; Okajima, Hidekazu; Takigawa, Tomoshi; Ichiyanagi, Toshikazu; and Takimoto, Hiroyuki, 4,456,349, Cl. 352-91.00C.
Okamoto, Takeshi: *See*—
Minagawa, Shoichi; Okamoto, Takeshi; and Niitsuma, Teruo, 4,456,847, Cl. 310-313.00R.
Okamura, Kazuhiko: *See*—
Okumura, Yasushi; Okamura, Kazuhiko; Fugakawa, Yasuo; Ishikura, Tomoyuki; Kouno, Kageaki; and Lein, Joseph, 4,456,592, Cl. 424-177.000.
Okamura, Shozo: *See*—
Masuda, Seiichi; Matsuo, Tohru; Ohkita, Yoshimichi; Aoki, Takeo; Nakajima, Hidemasa; Okamura, Shozo; Hirata, Takeyuki; and Anezaki, Shoji, 4,456,477, Cl. 75-51.000.
Okamura, Yasuyuki: *See*—
Tanaka, Fujio; Okamura, Yasuyuki; Kushiro, Yukitoshi; Ota, Chuichi; and Akiba, Shigeyuki, 4,456,998, Cl. 372-45.000.
Okubo, Yutaka: *See*—
Fukuda, Joji; and Okubo, Yutaka, 4,456,971, Cl. 364-900.000.
Okumura, Yasushi; Okamura, Kazuhiko; Fugakawa, Yasuo; Ishikura, Tomoyuki; Kouno, Kageaki; and Lein, Joseph, to Sanraku-Ocean Co.; and Panlabs Inc. Antibiotics, neoviridogriseins, and their method of production. 4,456,592, Cl. 424-177.000.
Olander Jr., Emil E.; James, Rex I.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., to Hewlett-Packard Company. Calculator including means for displaying alphanumeric prompting messages to the operator. 4,456,964, Cl. 364-710.000.
Oleck, Stephen M.; and Sherry, Howard S., to Mobil Oil Corporation. Catalyst for residua demetalation and desulfurization. 4,456,700, Cl. 502-220.000.
Olin Corporation: *See*—
Saeman, Walter C., 4,455,762, Cl. 34-170.000.
Oliver, John E., Jr.; and Singer, Arnold M. Chemically cleaning drilling/completion/packer brines. 4,456,537, Cl. 252-8.55R.
Olsen, Eric E. Submersible personal stereo system. 4,456,797, Cl. 179-156.00R.
Olympus Optical Company Limited: *See*—
Gocho, Nagahiro, 4,456,037, Cl. 141-1.000.
Mizokami, Kazunori, 4,456,353, Cl. 354-414.000.
Mizokami, Kazunori, 4,456,354, Cl. 354-414.000.
Omega S.A.: *See*—
Xuan, Mai T.; and Grosjean, Michel, 4,456,866, Cl. 318-696.000.

Omnithruster, Inc.: *See*—
Aker, Charles M., 4,455,960, Cl. 114-151.000.

Onda, Takanori: *See*—
Tsuruta, Kiyofumi; Osanai, Yoshimi; and Onda, Takanori, 4,455,884, Cl. 74-477.000.

Onodera, Kaoru: *See*—
Kadowaki, Takashi; and Onodera, Kaoru, 4,456,681, Cl. 430-505.000.

Onogi, Tsuyoshi; Ueoka, Tetsuya; Suzuki, Nobuo; Oohara, Yoshihito; and Onozuka, Toshiaki, to Hitachi, Ltd. Method of adjusting position of solid-state scanning element and mounting same. 4,457,017, Cl. 382-65.000.

Onozuka, Toshiaki: *See*—
Onogi, Tsuyoshi; Ueoka, Tetsuya; Suzuki, Nobuo; Oohara, Yoshihito; and Onozuka, Toshiaki, 4,457,017, Cl. 382-65.000.

Oohara, Yoshihito: *See*—
Onogi, Tsuyoshi; Ueoka, Tetsuya; Suzuki, Nobuo; Oohara, Yoshihito; and Onozuka, Toshiaki, 4,457,017, Cl. 382-65.000.

Oonaka, Hidemi: *See*—
Taifu, Tatsuya; and Oonaka, Hidemi, 4,456,568, Cl. 261-39.00A.

Ootsuka, Fumio: *See*—
Yoshimi, Akiro; Kamiya, Michihiko; Kojima, Yasuhumi; Ootsuka, Fumio; and Matsushima, Takeo, 4,456,055, Cl. 165-12.000.

Opel, Paul; Herbst, Klaus; Brinkmann, Heinz; Luders, Albrecht; and Wolsdorf, Hans P., to Mannesmann AG. Wheel and brake-drum configuration for vehicles. 4,456,308, Cl. 301-9.0DN.

Optik Innovation AB OIAB: *See*—
Astero, Ulf J., 4,455,893, Cl. 76-107.00R.

Orii, Akira: *See*—
Watanabe, Kazuo; Makabe, Hachiro; Orii, Akira; Hitatake, Michio; and Yamamoto, Kazuji, 4,456,859, Cl. 318-313.000.

O'Rourke, J. Cam; Marshall, Robert E.; Bercha, Frank G.; and Pilkington, G. Roger, to Dome Petroleum Limited. Drillship canopy. 4,455,958, Cl. 114-40.000.

Orr, Wallace H.; and Osteen, Mitchell M., to General Electric Company. Socket with automatic high voltage cut-off. 4,456,857, Cl. 315-360.000.

Osada, Kimio; Hayashi, Motokazu; and Kamei, Taketo, to Tokyo Shibaura Denki Kabushiki Kaisha. Compact fluorescent lamp. 4,456,854, Cl. 315-58.000.

Osaka Diamond Industrial Company, Ltd.: *See*—
Kawakita, Takao; Yamaguchi, Kazuo; and Date, Sadao, 4,456,577, Cl. 419-7.000.

Osanai, Yoshimi: *See*—
Tsuruta, Kiyofumi; Osanai, Yoshimi; and Onda, Takanori, 4,455,884, Cl. 74-477.000.

Osborne, William E.; and Ketre, Nicholas A., to Marlin Firearms Company, The. Last shot bolt hold-open device. 4,455,919, Cl. 89-138.000.

Oshida, Jun-ichi; Nishikawa, Osamu; Tsuruta, Hideki; Takeshita, Toru; Yamamoto, Itaru; and Ishimaru, Kenji, to Teijin Limited. Vitamin D_3 derivatives, process for preparation thereof, and antigens comprising said derivatives to be used for preparation of antibodies for immunochemical assay and antibodies prepared therefrom. 4,456,553, Cl. 260-397.200.

Osteen, Mitchell M.: *See*—
Orr, Wallace H.; and Osteen, Mitchell M., 4,456,857, Cl. 315-360.000.

Osterwald, Hermann: *See*—
Bauer, Kurt H.; and Osterwald, Hermann, 4,456,628, Cl. 427-3.000.

Ostwald, Wolf: *See*—
Neier, Wilhelm; Webers, Werner; and Ostwald, Wolf, 4,456,776, Cl. 568-899.000.

Ota, Chuichi: *See*—
Tanaka, Fujio; Okamura, Yasuyuki; Kushiro, Yukitoshi; Ota, Chuichi; and Akiba, Shigeyuki, 4,456,998, Cl. 372-45.000.

Otani, Susumu, to Nippon Electric Co., Ltd. Equalizer having a substantially constant gain at a preselected frequency. 4,456,893, Cl. 333-18.000.

Otis Elevator Company: *See*—
Salihi, Jalal T., 4,456,097, Cl. 187-29.00R.

Otsuka, Tsuruo; and Cristofano, Anthony A., to Verson Allsteel Press Company. Hydraulic cylinder apparatus. 4,455,932, Cl. 100-214.000.

Ott, Karl-Heinz: *See*—
Lindner, Christian; and Ott, Karl-Heinz, 4,456,734, Cl. 525-310.000.

Otting, Billy J., to Otting International, Inc. Method for treating textile materials. 4,455,700, Cl. 8-151.000.

Otting International, Inc.: *See*—
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Grossi, Anthony V.; Bolen, Charles E.; Hahn, Louis T.; and Marzocchi, Alfred, 4,456,633, Cl. 427-138.000.

Owens, James W., to Buckeye Cellulose Corporation, The. Bisbiguanide based antibacterial cleansing products. 4,456,543, Cl. 252-106.000.

Oy Helvar: *See*—
Sairanen, Martti, 4,456,855, Cl. 315-308.000.

Oy Wartsila Ab: *See*—
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Uchida, Shigeru; Watanabe, Kazuo; Ozawa, Kousaku; and Kawaharada, Minoru, 4,455,849, Cl. 72-41.000.

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Bayle-Laboure, Gerard J. P.; Buisson, Mark F. B.; Linstrumelle, Roger B.; and Pachot, Jean-Claude, 4,455,822, Cl. 60-39.822.

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Carrington, Wilbur A.; Fredricks, Ronald J.; Gubbins, Harry L.; Eckley, Gordon P.; Perfitt, Thomas E.; and Page, Jerry L., 4,456,376, Cl. 356-350.000.

Pako Corporation: *See*—
Kaufmann, Kenneth M.; Lundstrom, Robert W.; and Beer, Robert E., 4,456,355, Cl. 354-299.000.

Palacio, Joaquim J.: *See*—
Rionda, Carlos S.; and Palacio, Joaquim J., 4,455,805, Cl. 52-712.000.

Palen, Stephen E.: *See*—
Rock, Harold E.; and Palen, Stephen E., 4,455,764, Cl. 36-136.000.

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Palmer, Guy V.; and Schihl, Raymond J., to Automatic Hydraulic Devices. Load moving apparatus. 4,456,121, Cl. 198-750.000.

Palsson, Johannes S. Safety closure. 4,456,136, Cl. 215-216.000.

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Nelson, Kenneth W.; Woo, Ricky A.; Palumbo, Patrick D.; and Collins, Michael L., 4,456,626, Cl. 426-553.000.

Pamment, Noel G., to Industrial Containers Pty. Ltd., Cnr. Moore. Waste containers. 4,456,141, Cl. 220-1.00T.

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Panlabs Inc.: *See*—
Okumura, Yasushi; Okamura, Kazuhiko; Fugakawa, Yasuo; Ishikura, Tomoyuki; Kouno, Kageaki; and Lein, Joseph, 4,456,592, Cl. 424-177.000.

PaR Systems Corp.: *See*—
LaValle, Dean R.; and McLain, Philip A., 4,456,132, Cl. 212-160.000.

Paros, Jerome M., to Texas Instruments Incorporated. Digital pressure transducer. 4,455,874, Cl. 73-704.000.

Pasch, Manfred: *See*—
Edelmann, Hermann; Pasch, Manfred; Klose, Sigmar; Haar, Hans-Peter; and Mann, Karlheinz, 4,456,581, Cl. 422-72.000.

Pasco, Roland. Process for erecting a building and building erected in accordance therewith. 4,455,792, Cl. 52-90.000.

Pascoe, William M., Sr.: *See*—
McCollough, John K.; and Pascoe, William M., Sr., 4,456,818, Cl. 219-373.000.

Pasek, Eugene A.: *See*—
Harju, Philip H.; and Pasek, Eugene A., 4,456,763, Cl. 549-249.000.

Pastor, Stephen D.: *See*—
Spivack, John D.; and Pastor, Stephen D., 4,456,716, Cl. 524-104.000.

Paton, Boris E.; Samilov, Vladimir N.; Ivaschenko, Grigory P.; Krasjukov, Alexandr V.; and Balitsky, Vladimir M., deceased (by Balitskaya, Oxana V., administrator), to Institut Elektrosvarki Imeni E. O. Patona. Method for producing shapes having circular corrugations. 4,455,852, Cl. 72-82.000.

Patterson, Robert J., II. Modified RSR rotary atomizer. 4,456,444, Cl. 425-8.000.

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Bergsoe, Svend, 4,456,231, Cl. 266-215.000.

Paumellerie Electrique: *See*—
Saigne, Gerard, 4,455,708, Cl. 16-56.000.

Pavlath, George A.: *See*—
Shaw, H. John; and Pavlath, George A., 4,456,377, Cl. 356-350.000.

Pavlick, Michael J., to Budd Company, The. Low level freight car for carrying trailers. 4,456,413, Cl. 410-56.000.

Pease, Charles C.: *See*—
Wilkinson, Harold C.; Gum, Charles E.; Howe, Rodney C.; Macinskas, Dean P.; Pease, Charles C.; Raycher, Robert J.; Rosen, Ronald; and Williams, Francis J., 4,456,808, Cl. 219-98.000.

PEBRA GmbH Paul Braun: *See*—
Mehnert, Walter; Kollner, Hans J.; and Tonnes, Helmut, 4,456,817, Cl. 219-263.000.

Pechiney: *See*—
Wintenberger, Michel G., 4,456,480, Cl. 75-63.000.

Peitz, Josef. Overrunning wheel brake. 4,456,102, Cl. 188-331.000.

Peled, Emanuel; Meitav, Azieh; and Brand, Mordechai, to Ramot University Authority For Applied Research and Industrial Development Ltd. Calcium electrochemical reserve cell. 4,456,665, Cl. 429-105.000.

Pesa, Steven M.; Berti, Jerome L.; and Kovarik, Robert F., Jr., to Allis-Chalmers Corp. Fastening means in sealed gasket assembly including shoulder bolt. 4,456,268, Cl. 277-106.000.
Pepina, Oswald: *See*—
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Perez, Ethelwolbo P., to Phillips Petroleum Company. Separation of low boiling constituents from a mixed gas. 4,456,461, Cl. 62-28.000.
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Haas, Lawrence J.; Klibbe, Arthur W.; and Perez-Mendez, Pedro L, 4,456,996, Cl. 371-37.000.
Pet itt, Thomas E.: *See*—
Carrington, Wilbur A.; Fredricks, Ronald J.; Gubbins, Harry L.; Eckley, Gordon P.; Perfitt, Thomas E.; and Page, Jerry L., 4,456,376, Cl. 356-350.000.
Perkins, Sonnie J. Golf club swing training device. 4,456,257, Cl. 273-186.00R.
Perrone, Mathew R. P., Jr. Baseball teaching device. 4,456,250, Cl. 273-26.00R.
Pertron Controls Corporation: *See*—
Jones, Gary A.; Bacon, David C.; and Pooley, Monte A., 4,456,809, Cl. 219-108.000.
Pesa, F. A.: *See*—
Blaskie, M. W.; Fox, J. R.; and Pesa, F. A., 4,456,694, Cl. 502-74.000.
Pescatore, Eugene A., to Electro-Biology, Inc. Apparatus for equine hoof treatment. 4,456,001, Cl. 128-1.500.
Pesch, Jurgen, to G. Siempelkamp GmbH & Co. Mat-forming installation for pressedboard. 4,456,120, Cl. 198-648.000.
Pet Tech-Dril Saf, Inc.: *See*—
Winegeart, Mitchell E.; and Connelly, Lawrence, 4,456,217, Cl. 251-58.000.
Petcavich, Robert J., to Polytronix, Inc. Polymer packaging material for liquid crystal cell. 4,456,638, Cl. 428-1.000.
Peterson, Charles W., Jr.: *See*—
Lam, Chung H.; and Peterson, Charles W., Jr., 4,456,841, Cl. 307-530.000.
Petro-Canada Exploration Inc.: *See*—
Lorenz, Gordon; and Gehring, Ken, 4,456,536, Cl. 210-776.000.
Petrofina Canada Inc.: *See*—
Lorenz, Gordon; and Gehring, Ken, 4,456,536, Cl. 210-776.000.
Petruck, Gerd-Michael; Wambach, Paul R., deceased (by Wambach, Christa, heiress); and Wissner, Adolf, to Bayer Aktiengesellschaft. Process for the preparation of 2-chloro-4-nitrotoluese. 4,456,777, Cl. 568-937.000.
Pfaff, Hansen: *See*—
Henning, Hans-Heinrich; and Pfaff, Hansen, 4,456,433, Cl. 417-53.000.
Pfaff Industriemaschinen GmbH: *See*—
Muller, Richard, 4,455,923, Cl. 91-394.000.
Vollmar, Kurt, 4,455,957, Cl. 112-292.000.
Pfeffer, George B., to Datafile Limited. File label reading system. 4,457,016, Cl. 382-59.000.
Pfeifer, Gerhard: *See*—
Kraft, Winfried; Pfeifer, Gerhard; Reichel, Artur; and Richter, Kurt, 4,455,910, Cl. 83-874.000.
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Schubert, Peter; Pfeifer, Hermann; Hermann, Volker; Keller, Reimund; and Schulz, Eckhard, 4,456,449, Cl. 425-253.000.
Pfeiffer, Francis R., to SmithKline Beckman Corporation. N-Carboxyalkylproline-containing tripeptides. 4,456,594, Cl. 424-177.000.
Pfizer Inc.: *See*—
O'Brien, Daniel J., Jr., 4,456,753, Cl. 544-20.000.
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Middlebrook, Terence C., 4,456,727, Cl. 524-511.000.
Perez, Ethelwolbo P., 4,456,461, Cl. 62-28.000.
Siedenstrang, Roy W.; and Thorsrud, Agmund K., 4,456,706, Cl. 521-89.000.
Stapp, Paul R., 4,456,564, Cl. 260-504.00S.
Piccolo, Dominick J.: *See*—
Blackwell, Bernie; Netherwood, Shelley; and Piccolo, Dominick J., 4,456,621, Cl. 426-3.000.
Pichler, Heinrich; and Dum, Hermann. Method of operating a load from alternating current mains and circuit arrangement therefor. 4,456,835, Cl. 307-107.000.
Picker International, Inc.: *See*—
Jenkins, John L.; Pierce, Larry L.; and Pierce, June S., 4,457,010, Cl. 378-167.000.
Pierburg GmbH & Co. KG: *See*—
Sudbeck, Rainer; Baumgartner, Hans; and Schmitz, Eckehard, 4,455,987, Cl. 123-569.000.
Pierce, June S.: *See*—
Jenkins, John L.; Pierce, Larry L.; and Pierce, June S., 4,457,010, Cl. 378-167.000.
Pierce, Larry L.: *See*—
Jenkins, John L.; Pierce, Larry L.; and Pierce, June S., 4,457,010, Cl. 378-167.000.
Pierre Fabre S.A.: *See*—
Mouzin, Gilbert; Cousse, Henri; and Vilain, Pol, 4,456,614, Cl. 424-278.000.
Pierre, Rene: *See*—
Vanlerberghe, Guy; Sebag, Henri; and Pierre, Rene, 4,456,586, Cl. 424-70.000.
Pietsch, Hanns; Hohmann, Volker; and Eckloff, Willi, to Beiersdorf Aktiengesellschaft. Process for the preparation of a powder mixture for surgical use. 4,456,711, Cl. 523-206.000.
Pietschmann, Helmut; and Lipp, Herbert, to Sybron Corporation. Dental chair. 4,456,297, Cl. 297-316.000.
Piezo Electric Products, Inc.: *See*—
Kolm, Henry H.; and Kolm, Eric A., 4,456,394, Cl. 400-124.000.
Pilbrow, Malcolm F.: *See*—
Zollner, Dieter; Zollner, Christine; Lauterbach-Dammler, Inge; Koziol, Konrad; and Pilbrow, Malcolm F., 4,456,519, Cl. 204-290.00R.
Pilkington, G. Roger: *See*—
O'Rourke, J. Cam; Marshall, Robert E.; Bercha, Frank G.; and Pilkington, G. Roger, 4,455,958, Cl. 114-40.000.
Pillsbury Company, The: *See*—
Durst, Jack R., 4,456,625, Cl. 426-106.000.
Pine, Charles K.: *See*—
Tippins, George W.; Thomas, John E.; Connolly, Richard S.; Pine, Charles K.; and Pottmeyer, Wayne G., 4,455,848, Cl. 72-12.000.
Pinner, Felton R., Jr., to Marathon Oil Company. Process for inhibiting hydrate formation in producing gas wells. 4,456,067, Cl. 166-279.000.
Pinson, George T., to Boeing Company, The. Missile deployment apparatus. 4,455,943, Cl. 102-489.000.
Pinto, Adolf P. Maximized thermal efficiency hot gas engine. 4,455,825, Cl. 60-517.000.
Pioneer Electronic Corporation: *See*—
Nishioka, Akira; Kawanabe, Yoshihiro; Fujimoto, Hideki; and Takahori, Hiroyuki, 4,456,886, Cl. 330-254.000.
Tokumo, Akio, 4,456,887, Cl. 330-261.000.
Pioneer Magnetics, Inc.: *See*—
Incledon, Stephen H., 4,456,949, Cl. 363-26.000.
Pippert, Aaron J., to Utex Industries, Inc. Molding apparatus. 4,456,448, Cl. 425-234.000.
Pisik, Jay J.: *See*—
Vcelka, John L.; Pisik, Jay J.; and Hohberger, Clive P., 4,456,009, Cl. 604-152.000.
Pitcher, William E.; Baione, Peter W.; and Morelli, John A., to Automatic Connector, Inc. Connector for coaxial cables. 4,456,323, Cl. 339-177.00R.
Pitney Bowes Inc.: *See*—
Hatzis, Van, 4,456,364, Cl. 355-3.0DD.
Plaspack Kunststoff GmbH & Co. KG: *See*—
Balaz, Anton, 4,456,251, Cl. 273-29.00A.
Plasson Maagan Michael Industries Ltd.: *See*—
Kantor, Itzhak, 4,456,026, Cl. 137-315.000.
Plattner, Jacob J.; and Fung, Anthony K., to Abbott Laboratories. Benzisoxazole carboxylic acids. 4,456,612, Cl. 424-272.000.
Plessey Overseas Limited: *See*—
Cooper, Paul V., 4,456,974, Cl. 365-2.000.
Morroll, Terence D.; and Straw, David A., 4,456,908, Cl. 340-644.000.
Podolsky, Leaman B.: *See*—
Binstock, Morton H.; McCloskey, Thomas H.; and Podolsky, Leaman B., 4,455,836, Cl. 60-663.000.
Poe, Boyd L. Welder's goggles. 4,455,688, Cl. 2-431.000.
Polak's Frutal Works, B.V.: *See*—
Lenselink, Willem, 4,456,561, Cl. 260-464.000.
Polaroid Corporation: *See*—
Baker, James G., 4,456,783, Cl. 136-246.000.
Cerankowski, Leon D.; LaPointe, Gary S.; and Mattucci, Neil C., 4,456,674, Cl. 430-221.000.
Poliniak, Eugene S.: *See*—
Ban, Vladimir S.; and Poliniak, Eugene S., 4,456,636, Cl. 427-240.000.
Pollmeier, Franz-Josef; and Ihlein, Walter, to Siemens Aktiengesellschaft. Tape-wound insulation sheath or jacket for an electrical conductor. 4,456,651, Cl. 428-324.000.
Pollock, Robert W., to Siemens Gammasonics, Inc. Method for cleaning and annealing a thermoluminescent radiation detector crystal. 4,456,487, Cl. 134-31.000.
Polony, Rudolf: *See*—
Holzle, Gerd; Reinert, Gerhard; and Polony, Rudolf, 4,456,452, Cl. 8-103.000.
Polysar International S.A.: *See*—
Lambert, Jean-Pierre; and L'Huillier, Michel, 4,456,534, Cl. 210-725.000.
Polytronix, Inc.: *See*—
Petcavich, Robert J., 4,456,638, Cl. 428-1.000.
Pommer, Ernst-Heinrich: *See*—
Sauter, Hubert; Ammermann, Eberhard; Rentzea, Costin; and Pommer, Ernst-Heinrich, 4,456,608, Cl. 424-269.000.
Pompei, Francesco, to Amtrol Inc. Hot-water heating system having an air eliminator. 4,456,456, Cl. 55-203.000.
Poncin, Andre . Shovel excavator bucket teeth. 4,455,771, Cl. 37-142.00A.
Pont-A-Mousson S.A.: *See*—
Bacroix, Marcel; Menini, Joseph; and Lagoutte, Serge, 4,456,040, Cl. 141-150.000.
Gourmel, Yves, 4,456,053, Cl 164-421.000.
Pooley, Monte A.: *See*—
Jones, Gary A.; Bacon, David C.; and Pooley, Monte A., 4,456,809, Cl. 219-108.000.
Poot, Cornelis: *See*—
Van Heteren, Jan; Poot, Cornelis; Reckweg, Freek; and Stewart, Murray F., 4,456,627, Cl. 426-603.000.
Porath, Deanna F. Pedal operated mower. 4,455,816, Cl. 56-249.000.

Porlier, Joseph A. G.: *See—*
Steffler, Jean C.; Kaufman, Herman; Porlier, Joseph A. G.; and Firth, James A., 4,455,685, Cl. 2-2.10A.

Portec, Inc.: *See—*
Reeve, John C.; and Woodman, Howard C., 4,455,947, Cl. 105-377.000.

Possati, Mario, to Finike Italiana Marposs S.p.A. System for the suspension of modular units. 4,456,130, Cl. 211-26.000.

Post Office, The: *See—*
Groves, Ian S.; Guard, David R.; Bunting, John G.; Rowlands, Christopher E.; Powter, Edwin J.; Holmes, David W. J.; and Trott, Graham J., 4,456,789, Cl. 179-18.0BC.
Whitehead, Graham K.; and Bates, Roger J., 4,456,331, Cl. 350-96.230.

Pottmeyer, Wayne G.: *See—*
Tippins, George W.; Thomas, John E.; Connolly, Richard S.; Pine, Charles K.; and Pottmeyer, Wayne G., 4,455,848, Cl. 72-12.000.

Poulain Ricros, Andre . Apparatus for securing electrical connectors. 4,456,319, Cl. 339-92.00R.

Powell, John R., to Brown Fintube Company. Heat exchanger tube support. 4,456,058, Cl. 165-154.000.

Powter, Edwin J.: *See—*
Groves, Ian S.; Guard, David R.; Bunting, John G.; Rowlands, Christopher E.; Powter, Edwin J.; Holmes, David W. J.; and Trott, Graham J., 4,456,789, Cl. 179-18.0BC.

PPG Industries, Inc.: *See—*
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Precision Metal Fabricators, Inc.: *See—*
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Preh Elektrofeinmechanische Werke Jakob Preh Nachf. GmbH & Co.: *See—*
Buhner, Ernst; Zink, Ottmar; and Hahn, Gunter, 4,456,229, Cl. 266-95.000.

President and Fellows of Harvard College: *See—*
Dvorak, Harold F.; and Senger, Donald R., 4,456,550, Cl. 260-112.00R.
Green, Howard, 4,456,687, Cl. 435-241.000.

Presley, Glen T. Trencher power control system. 4,455,770, Cl. 37-66.000.

Preston Engravers, Inc.: *See—*
Kesten, Martin, 4,455,903, Cl. 83-346.000.

Pretzer, Paul R., to General Mills, Inc. Transplanting apparatus utilizing a disc mechanism for transferring plants from a supply tape to the furrow. 4,455,950, Cl. 111-2.000.

Price, Donald A., Jr.; and Louis, Charles A., III, to United States of America, Navy. Burst height compensation. 4,456,202, Cl. 244-3.150.

Price, Robert B.; and Jones, David L., to Texas Instruments Incorporated. Apparatus for teaching and transforming noncoincident coordinate systems. 4,456,961, Cl. 364-513.000.

Pro-Line, Inc.: *See—*
Zide, Robert M., 4,455,686, Cl. 2-23.000.

Procter & Gamble Company, The: *See—*
Nelson, Kenneth W.; Woo, Ricky A.; Palumbo, Patrick D.; and Collins, Michael L., 4,456,626, Cl. 426-553.000.

Prudenziati, Maria, to Fiat Trattori S.p.A. Force measurement device for controlling the position of an implement for towing by an agricultural machine. 4,456,074, Cl. 172-7.000.

Prum, Charles: *See—*
Mathgen, Georges; Scherer, Robert; Prum, Charles; and Leick, Roger, 4,457,002, Cl. 373-95.000.

PTX-Pentronix, Inc.: *See—*
DeSantis, Raymond P.; and Puffer, Herbert J., Jr., 4,456,445, Cl. 425-78.000.

Puffer, Herbert J., Jr.: *See—*
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Punako, Stephen: *See—*
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Pyrotector, Inc.: *See—*
Johnson, Robert E., 4,456,907, Cl. 340-629.000.

Quarles, James H. Ice making machine for selectively making solid and hollow ice. 4,455,843, Cl. 62-73.000.

Quayle, Stanley F.: *See—*
Schlosser, Philip A.; and Quayle, Stanley F., 4,456,787, Cl. 178-19.000.

Queen's University at Kingston: *See—*
Clark, Reginald H.; and Nodelman, Joel R., 4,455,881, Cl. 73-863.210.
Wevers, Henk W.; Sorbie, Charles; and Saunders, Gerald A. B., 4,456,006, Cl. 128-92.00B.

Quick, Leonard M.: *See—*
Hensley, Albert L., Jr.; and Quick, Leonard M., 4,456,699, Cl. 502-208.000.

Rabotski, John, to Design Engineering Service Inc. Machine for steam chest molding of foamed material. 4,456,443, Cl. 425-4.00R.

Radadia, Dhiru: *See—*
Kushner, James; Constantine, Walter F.; Radadia, Dhiru; and Codega, Louis S., 4,456,785, Cl. 174-105.0SC.

Radcliffe, Thomas R., to Eaton Corporation. Combined shift control. 4,455,883, Cl. 74-475.000.

Raden, Daniel S.: *See—*
Arbir, Francis W.; Raden, Daniel S.; Narducy, Kenneth W.; and Casati, Francois M., 4,456,696, Cl. 502-167.000.

Radiall Industrie: *See—*
Staeger, Hanspeter, 4,456,324, Cl. 339-177.00R.

Raftery, William B., to Steelcase, Inc. Height adjustable furniture support. 4,456,212, Cl. 248-558.000.

Ragazzini, Franco; and Colombo, Roberto, to Lavorazione Materie Plastiche L.M.P. S.p.A. Method for the production of aged and expanded polystyrene panels. 4,456,573, Cl. 264-53.000.

Raichoudhury, Prosenjit: *See—*
Dutta, Subhadra; and Raichoudhury, Prosenjit, 4,456,490, Cl. 148-1.500.

Railway Engineering Associates, Inc.: *See—*
List, Harold A., 4,455,946, Cl. 105-168.000.

Rajan, Sundar J., to Ethyl Corporation. Polyurethanes prepared from polycarbonates. 4,456,745, Cl. 528-85.000.

Raley, Garland E.: *See—*
Thomas, Paul E.; and Raley, Garland E., 4,456,570, Cl. 264-22.000.

Ramot University Authority For Applied Research and Industrial Development Ltd.: *See—*
Peled, Emanuel; Meitav, Azieh; and Brand, Mordechai, 4,456,665, Cl. 429-105.000.

Ransom, Charles R. Cartridge hopper for loading machine. 4,455,915, Cl. 86-46.000.

Rao, B. Rama; and Susman, Leon, to Sperry Corporation. Sub-array polarization control for a monopulse dome antenna. 4,456,913, Cl. 343-361.000.

Rao, Gadicherla V. R., to Rockwell International Corporation. Shock wave suppressing flow plate for pulsed lasers. 4,457,000, Cl. 372-58.000.

Rao, Purushothama; and Nelson, Wendy J., to GNB Batteries Inc. Low antimony lead-based alloy and method. 4,456,579, Cl. 420-566.000.

Rasshofer, Werner: *See—*
Balle, Gerhard; and Rasshofer, Werner, 4,456,730, Cl. 524-839.000.

Rassieur, Charles L., to Central Mine Equipment Company. Apparatus and method for taking soil samples. 4,456,079, Cl. 175-58.000.

Rath, Heinrich B., to Lucas Industries Limited. Wheel slide protection system. 4,456,309, Cl. 303-10.000.

Ratzel, Rudiger; and Schneider, Erich, to Robert Bosch GmbH. Automatic positioning system for fully reclining vehicle seats. 4,456,861, Cl. 318-568.000.

Rauch, Hubert: *See—*
Siol, Werner; Fink, Herbert; Klesse, Wolfgang; Rauch, Hubert; and Suetterlin, Norbert, 4,456,726, Cl. 524-501.000.

Raycher, Robert J.: *See—*
Wilkinson, Harold C.; Gum, Charles E.; Howe, Rodney C.; Macinskas, Dean P.; Pease, Charles C.; Raycher, Robert J.; Rosen, Ronald; and Williams, Francis J., 4,456,808, Cl. 219-98.000.

Raymond, Gary E. Dispenser means for rolled sheet materials. 4,455,905, Cl. 83-422.000.

Raytheon Company: *See—*
Ayasli, Yalcin. 4,456,888, Cl. 330-277.000.

RCA Corporation: *See—*
Balaban, Alvin R.; and Steckler, Steven A., 4,456,922, Cl. 358-31.000.
Ban, Vladimir S.; and Poliniak, Eugene S., 4,456,636, Cl. 427-240.000.
Faulkner, Richard D.; and Henry, Dale V., 4,456,852, Cl. 313-348.000.
Kleinknecht, Hans P., 4,456,879, Cl. 324-158.00D.
Schade, Otto H., Jr., 4,456,837, Cl. 307-262.000.
Tomcavage, Joseph R., 4,456,851, Cl. 313-250.000.

Reardon, Francis J.: *See—*
Callanan, Dennis T.; Lawson, Gerald P.; and Reardon, Francis J., 4,455,900, Cl. 82-4.00A.

Recchuite, Alexander D., to Sun Tech, Inc. Process of sulfurizing triglyceride and an olefin. 4,456,540, Cl. 252-48.600.

Reckweg, Freek: *See—*
Van Heteren, Jan; Poot, Cornelis; Reckweg, Freek; and Stewart, Murray F., 4,456,627, Cl. 426-603.000.

Reeck, David L.: *See—*
Iftikar, Syed H.; and Reeck, David L., 4,456,937, Cl. 360-106.000.

Reed, Francis K., to Motorola Inc. Time reference tracking loop for frequency hopping systems. 4,457,003, Cl. 375-1.000.

Reeve, Gary L.: *See—*
Snyder, Steven A.; and Reeve, Gary L., 4,456,275, Cl. 280-163.000.

Reeve, John C.; and Woodman, Howard C., to Portec, Inc. Covered hopper car. 4,455,947, Cl. 105-377.000.

Regenass, Willy; Giger, Gerhard; Kuster, Kaspar; and Achermann, Heinz, to Ciba-Geigy Corporation. Heat flow calorimeter. 4,456,389, Cl. 374-31.000.

Regie Nationale des Usines Renault: *See—*
Jung, Jean; Gourdou, Pierre; and Jacob, Yvon, 4,455,965, Cl. 118-622.000.

Regis, Richard R.: *See—*
Doweyko, Arthur M. P.; Regis, Richard R.; and Bell, Allyn R., 4,456,470, Cl. 71-94.000.

Rehme, Hans: *See—*
Krueger, Hans; and Rehme, Hans, 4,456,515, Cl. 204-192.00P.

Reichel, Artur: *See—*
Kraft, Winfried; Pfeifer, Gerhard; Reichel, Artur; and Richter, Kurt, 4,455,910, Cl. 83-874.000.

Reid, Joyce: *See—*
Nakane, Masami; Snitman, David L.; Reid, Joyce; and Haslanger, Martin F., 4,456,615, Cl. 424-285.000.

Reiff, Harro, to Karl Mengele & Sohne. Gate shears. 4,455,906, Cl. 83-438.000.

Reimels, Harry G.; Cerundolo, Daniel G.; and Downing, Roy W., to Codman & Shurtleff, Inc. Cranial drill. 4,456,010, Cl. 128-310.000.

Reinert, Gerhard: *See*—
Holzle, Gerd; Reinert, Gerhard; and Polony, Rudolf, 4,456,452, Cl. 8-103.000.
Reinsch, Royal L.: *See*—
Maes, Michel E.; Shaw, Robert L.; and Reinsch, Royal L., 4,456,494, Cl. 149-21.000.
Rentzea, Costin: *See*—
Sauter, Hubert; Ammermann, Eberhard; Rentzea, Costin; and Pommer, Ernst-Heinrich, 4,456,608, Cl. 424-269.000.
Repass, James T.: *See*—
Herzik, Aubrey M.; Hobbs, Sharon S.; and Repass, James T., 4,456,969, Cl. 364-900.000.
Respitrace Corporation: *See*—
Sackner, Marvin A., 4,456,015, Cl. 128-721.000.
Rhodes, David: *See*—
Newman, Alec T.; Rhodes, David; and Edge, Brian A., 4,456,148, Cl. 221-132.000.
Rhone-Poulenc, Inc.: *See*—
Giacobbe, Thomas J.; Williams, Thomas N., Jr.; and Horn, James M., 4,456,767, Cl. 562-414.000.
Rhone-Poulenc Industries: *See*—
Cassat, Robert; and Vignando, Bruno, 4,456,657, Cl. 428-415.000.
Rhone-Poulenc Sante: *See*—
Aloup, Jean-Claude; Bouchaudon, Jean; Farge, Daniel; and James, Claude, 4,456,758, Cl. 546-284.000.
Ribassin, Patrick; Gallardo, Manuel; and Bertin, Alain J. L., to Robot-Coupe, S.A. Apparatus for treating food. 4,456,185, Cl. 241-92.000.
Ricca, Aldo: *See*—
Simonotti, Lucio; and Ricca, Aldo, 4,456,234, Cl. 270-18.000.
Rice, Donald W. Structural building member. 4,455,806, Cl. 52-732.000.
Richardson, Ethel L.: *See*—
Bullions, Robert J., III; Curlee, Thomas O., III; Gum, Peter H.; McGilvray, Bruce L.; and Richardson, Ethel L., 4,456,954, Cl. 364-200.000.
Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo , 4,456,607, Cl. 424-262.000.
Toth, Jozsef; Hajos, Gyorgy; Fekete, Gyorgy; Horvath, Istvan; Szporny, Laszlo ; Boor nee Mezei, Anna; Aranyi, Peter; Naray, Aniko; Gorog, Sandor; Holly, Sandor; and Molnar, Csaba, 4,456,601, Cl. 424-241.000.
Richter, Hans-Jurgen: *See*—
Schumann, Frank; Richter, Hans-Jurgen; Stiefel, Werner; and Fritzsche, Klaus, 4,456,379, Cl. 356-381.000.
Richter, Kurt: *See*—
Kraft, Winfried; Pfeifer, Gerhard; Reichel, Artur; and Richter, Kurt, 4,455,910, Cl. 83-874.000.
Richter, Roland; Hettel, Hans; and Muller, Hanns P., to Bayer Aktiengesellschaft. Polyisocyanate mixtures, process for their production and their use in the production of polyurethane plastics. 4,456,709, Cl. 521-160.000.
Richter, Sidney B.: *See*—
Krass, Dennis K.; and Richter, Sidney B., 4,456,466, Cl. 71-88.000.
Rick, John W. Position locating apparatus and method. 4,455,748, Cl. 33-1.0CC.
Ricoh Company, Ltd.: *See*—
Mizuma, Kenichi, 4,456,238, Cl. 271-3.100.
Yuasa, Kazuhiro, 4,456,365, Cl. 355-3.0CH.
Riemscheid, Helmut: *See*—
Krude, Werner; Muller, Karl-Heinz; and Riemscheid, Helmut, 4,456,269, Cl. 277-212.0FB.
Rigo, Marcel L.: *See*—
Lissajoux, Pierre J.; and Rigo, Marcel L., 4,455,887, Cl. 74-573.00R.
Rion Kabushiki Kaisha: *See*—
Saito, Osamu, 4,456,795, Cl. 179-107.00H.
Rionda, Carlos S.; and Palacio, Joaquim J., to Gang-Nail Systems, Inc. Truss assembly and truss hanger for use with trusses. 4,455,805, Cl. 52-712.000.
Riple, David E., to Lubrizol Corporation, The. Process for preparing molybdenum-containing compositions useful for improved fuel economy of internal combustion engines. 4,456,538, Cl. 252-32.70E.
Rivers, Robert. Hinge lock mechanism for display units. 4,456,050, Cl. 160-233.000.
Roach, Alva B., Jr., to Houston Industries. Automatic testing of carrier relay equipment in electrical power transmission lines. 4,456,906, Cl. 340-516.000.
Robert Bosch GmbH: *See*—
Hafner, Udo; and Hans, Waldemar, 4,455,982, Cl. 123-472.000.
Hess, Heinz, 4,456,921, Cl. 358-31.000.
Kampichler, Gunter, 4,455,868, Cl. 73-119.00A.
Ratzel, Rudiger; and Schneider, Erich, 4,456,861, Cl. 318-568.000.
Schillinger, Rainer; Ruhl, Karl; Kemmner, Ulrich; and Schuler, Hans, 4,456,436, Cl. 417-366.000.
Schmid, Wolfgang; Wanner, Karl; Falchle, Jorg; Bleicher, Manfred; and Muller, Frank, 4,456,076, Cl. 173-116.000.
Weigle, Dieter; Zirps, Wilhelm; and Schaub, Uwe, 4,456,170, Cl. 236-84.000.
Roberts, Donald E. Flatware washing machine. 4,456,022, Cl. 134-99.000.
Roberts, Harold A.; and Wey, Robert A., to Augat Inc. Cleaving tool for optical fibers. 4,456,159, Cl. 225-96.500.
Roberts, John I. Freeze protection valve assembly. 4,456,024, Cl. 137-62.000.
Roberts, Richard D. Hand held opening apparatus. 4,455,894, Cl. 81-3.10R.
Robertson, John W., Jr.; and Smith, James M., to Babcock & Wilcox Company, The. High torque servo positioner using 3 phase variable frequency constant torque controller. 4,456,865, Cl. 318-599.000.
Robinder, Ronald C.; Bates, David J.; and Denham, Dan F., to Tektronix, Inc. Feedback CRT for use in a closed-loop correction system. 4,456,853, Cl. 313-421.000.
Robinson, Chris J.: *See*—
Hartnett, Michael J.; Robinson, Chris J.; and Tharp, Edwin B., 4,456,313, Cl. 308-202.000.
Robinson, Richard C.: *See*—
Buss, Waldeen C.; Field, Leslie A.; and Robinson, Richard C., 4,456,527, Cl. 208-89.000.
Robot-Coupe, S.A.: *See*—
Ribassin, Patrick; Gallardo, Manuel; and Bertin, Alain J. L., 4,456,185, Cl. 241-92.000.
Robson, Robert. Lifting apparatus. 4,456,421, Cl. 414-546.000.
Roche, Joseph R.; Alexander, Gabriel G.; and Tippit, Larry J., to Hydril Company. Flow diverter. 4,456,062, Cl. 166-84.000.
Roche, Joseph R., to Hydril Company. Flow diverter. 4,456,063, Cl. 166-84.000.
Rochlitzer, Frank: *See*—
Traub, Stefan; and Rochlitzer, Frank, 4,456,833, Cl. 307-80.000.
Rock, Harold E.; and Palen, Stephen E. Mountable warming cap for a shoe or boot. 4,455,764, Cl. 36-136.000.
Rockwell International Corporation: *See*—
Dugan, John M., 4,455,729, Cl. 29-235.000.
Fowks, William R., 4,456,891, Cl. 331-3.000.
Godejahn, Gordon C., Jr., 4,455,737, Cl. 29-571.000.
King, James R., 4,457,020, Cl. 455-70.000.
Landt, Harvey L.; and Snider, Glenn R., 4,456,895, Cl. 333-174.000.
Nicholson, Margie M., 4,456,337, Cl. 350-357.000.
Rao, Gadicherla V. R., 4,457,000, Cl. 372-58.000.
Rodari, Gianpiero, to Marelli Autronica S.p.A. Split windings motor vehicle alternator. 4,456,870, Cl. 322-29.000.
Rodrigues, Anil N.: *See*—
Cable, Harold E.; and Rodrigues, Anil N., 4,456,228, Cl. 266-70.000.
Rodson, Marius; and Scher, Herbert B., to Stauffer Chemical Company. Encapsulation process. 4,456,569, Cl. 264-4.700.
Roehr, George L.: *See*—
Ruck, Wilf; Russell, Brian; Roehr, George L.; and Catalanotti, Paul R., 4,456,214, Cl. 249-144.000.
Roehr Tool Corporation: *See*—
Ruck, Wilf; Russell, Brian; Roehr, George L.; and Catalanotti, Paul R., 4,456,214, Cl. 249-144.000.
Roffelsen, Franciscus, to Spiro Research B.V. Method of and apparatus for the degassification of circulation systems for liquids. 4,456,172, Cl. 237-66.000.
Rogers, Alfred M., III; and Carter, Frank E., to Thomson Industries, Inc. Combination of rotary and rectilinear bearing. 4,456,312, Cl. 308-6.00C.
Rogness, Donald E.: *See*—
Johnson, Alfred O.; Rogness, Donald E.; and White, George W., 4,456,989, Cl. 370-94.000.
Rohm GmbH: *See*—
Siol, Werner; Fink, Herbert; Klesse, Wolfgang; Rauch, Hubert; and Suetterlin, Norbert, 4,456,726, Cl. 524-501.000.
Rolf, Richard L.; and Sharp, Maurice L., to Aluminum Company of America. Metal spring stub and ceramic body electrode assembly. 4,456,517, Cl. 204-286.000.
Rooklyn, Jack, to Industrial Management Company. Table with conductive top. 4,456,944, Cl. 361-212.000.
Roper, Jerry M.: *See*—
Everly, Charles R.; and Roper, Jerry M., 4,456,770, Cl. 568-315.000.
Everly, Charles R.; and Roper, Jerry M., 4,456,771, Cl. 568-315.000.
Rose, Robert F.; and Manning, Lonnie W., to Dixon Automatic Tool, Inc. Self-contained multi-mode vibratory feeder control with unitary delay adjustment. 4,456,822, Cl. 250-223.00R.
Rose Verpackungsmaschinenfabrik Theegarten GmbH & Co.: *See*—
Schmitz, Heinz, 4,455,902, Cl. 83-150.000.
Rosen, Ronald: *See*—
Wilkinson, Harold C.; Gum, Charles E.; Howe, Rodney C.; Macinskas, Dean P.; Pease, Charles C.; Raycher, Robert J.; Rosen, Ronald; and Williams, Francis J., 4,456,808, Cl. 219-98.000.
Rosenbaum, Walter S.: *See*—
Carlgren, Richard G.; Rosenbaum, Walter S.; and Tannenbaum, Alan R., 4,456,973, Cl. 364-900.000.
Rosenfeld, Gideon, to Scitex Corporation Ltd. Screened image reproduction. 4,456,924, Cl. 358-75.000.
Rosenquist, Niles R.: *See*—
Liu, Ping Y.; and Rosenquist, Niles R., 4,456,725, Cl. 524-476.000.
Rossi, Piergiorgio, to Oemb SA. Wire bending apparatus and a method of bending a wire. 4,456,036, Cl. 140-105.000.
Rothmans of Pall Mall Canada Limited: *See*—
Brackmann, Warren A.; and Snaidr, Stanislav M., 4,456,018, Cl. 131-116.000.
Rottmaier, Ludwig; Merten, Rudolf; Siebourg, Wolfgang; and Lachmann, Burkhard, to Bayer Aktiengesellschaft. Flameproof polyamide moulding compositions. 4,456,715, Cl. 524-100.000.
Rovida, Ettore. Foldable crib or playpen of reduced encumbrance. 4,455,697, Cl. 5-99.00C.
Rowland, David L. Stackable armchair. 4,456,296, Cl. 297-239.000.

Rowlands, Christopher E.: *See*—
Groves, Ian S.; Guard, David R.; Bunting, John G.; Rowlands, Christopher E.; Powter, Edwin J.; Holmes, David W. J.; and Trott, Graham J., 4,456,789, Cl. 179-18.0BC.
RSV-Gusto Engineering B.V.: *See*—
Boon, Bart, 4,456,403, Cl. 405-196.000.
RTE Corporation: *See*—
Bronikowski, Raymond J., 4,456,942, Cl. 361-127.000.
Rubens, Harry E. Spring-locked rotatable heel. 4,455,766, Cl. 36-39.000.
Rubinstein, Alan, to Cedars Sinai Medical Center. Heat treatment of lyophilized blood clotting factor VIII concentrate. 4,456,590, Cl. 424-101.000.
Ruck, Wilf; Russell, Brian; Roehr, George L.; and Catalanotti, Paul R., to Roehr Tool Corporation. Molding apparatus with positive collapse core. 4,456,214, Cl. 249-144.000.
Ruegg, Christoph; and Voirol, Peter, to Ciba-Geigy Corporation. Pin for connecting machine elements with each other. 4,456,653, Cl. 428-379.000.
Ruhl, Karl: *See*—
Schillinger, Rainer; Ruhl, Karl; Kemmner, Ulrich; and Schuler, Hans, 4,456,436, Cl. 417-366.000.
Rumford, Kimball J.: *See*—
Janik, Stanley G.; and Rumford, Kimball J., 4,455,821, Cl. 60-39.091.
Rumpel, Manfred, to Ford Motor Company. Independent rear wheel suspension with a toe angle controlling trailing arm. 4,456,282, Cl. 280-690.000.
Rusina, Fulvio: *See*—
Castellino, Paolo; and Rusina, Fulvio, 4,457,013, Cl. 381-46.000.
Russell, Brian: *See*—
Ruck, Wilf; Russell, Brian; Roehr, George L.; and Catalanotti, Paul R., 4,456,214, Cl. 249-144.000.
Russell, David B., to Dennison Manufacturing Company. Method and apparatus for dispensing fasteners. 4,456,123, Cl. 206-343.000.
Russell, David B., to Dennison Manufacturing Company. Method and apparatus for dispensing fasteners. 4,456,161, Cl. 227-67.000.
Russell, Homer C.: *See*—
Olander Jr., Emil E.; James, Rex I.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,456,964, Cl. 364-710.000.
Russell, John N.: *See*—
Buckley, Leo P., Jr.; Chausse, Burnette P.; Chen, Arthur C.; Russell, John N.; and Wong, Thomas Y., 4,455,820, Cl. 60-39.030.
Ryan, Joseph J.: *See*—
Finnern, David L., 4,455,718, Cl. 405-186.000.
Ryan, Philip M., to International Business Machines Corporation. Apparatus for high speed fault mapping of large memories. 4,456,995, Cl. 371-21.000.
S.N.E.C.M.A.: *See*—
Cuvillier, Michel L., 4,456,428, Cl. 416-97.00R.
S & W Instruments, Inc.: *See*—
Wiggins, Gene D., 4,456,963, Cl. 364-551.000.
Saari, Walfred S., to Merck & Co., Inc. 1-(3-Halo-2-pyridinyl) piperazine. 4,456,604, Cl. 424-250.000.
Sackner, Marvin A., to Respitrace Corporation. Non-invasive method for semiquantitative measurement of neck volume changes. 4,456,015, Cl. 128-721.000.
Sacks, Jacob M.: *See*—
Carter, F. Anthony; and Sacks, Jacob M., 4,456,968, Cl. 364-900.000.
Sadko, Vladimir I.: *See*—
Ermolovich, Vyacheslav I.; Klushin, Valery A.; Sadko, Vladimir I.; and Schukin, Valery Y., 4,455,854, Cl. 72-90.000.
Saeman, Walter C., to Olin Corporation. Glass batch pellet production and drying process and apparatus. 4,455,762, Cl. 34-170.000.
Saenger, Dietrich: *See*—
Leyrer, Reinhold J.; and Saenger, Dietrich, 4,456,679, Cl. 430-326.000.
Saigne, Gerard, to Paumellerie Electrique. Door closer having a braking mechanism comprising an elastomeric bag. 4,455,708, Cl. 16-56.000.
Sairanen, Martti, to Oy Helvar. Intensity regulator, especially a light regulator. 4,456,855, Cl. 315-308.000.
Saito, Mitsuru: *See*—
Hayashi, Tsutomu; Kato, Masaie; and Saito, Mitsuru, 4,456,310, Cl. 303-10.000.
Saito, Osamu, to Rion Kabushiki Kaisha. Behind-the-ear type hearing aid. 4,456,795, Cl. 179-107.00H.
Saito, Satoshi: *See*—
Sugimoto, Yasuo; Maeda, Masami; Ishimura, Hiroshi; Saito, Satoshi; and Chinone, Koichi, 4,455,818, Cl. 57-293.000.
Saka, James Y. Convertible skier seat and ski carrier. 4,456,284, Cl. 280-812.000.
Sakai, Hiroshi: *See*—
Nishiura, Masaharu; Sakai, Hiroshi; Miyagi, Masahide; Uchida, Yoshiyuki; and Haruki, Hiromu, 4,456,782, Cl. 136-244.000.
Sakai, Kiyoshi: *See*—
Mabuchi, Minoru; Fujimura, Naoto; Ishikawa, Shozo; Takasu, Yoshio; Sakai, Kiyoshi; and Kuribayashi, Masaki, 4,456,671, Cl. 430-58.000.
Sakai, Shoji; Fujiwara, Michiaki; Kubota, Nobunori; and Noda, Koshi, to Murata Kikai Kabushiki Kaisha. Apparatus for slacking yarn in winder. 4,456,188, Cl. 242-35.50R.
Sakai, Takamasa: *See*—
Sato, Yasuo; and Sakai, Takamasa, 4,456,917, Cl. 357-14.000.
Sakakibara, Shiro. Hydraulic control means for an automatic transmission. 4,455,892, Cl. 74-869.000.
Sakakibara, Shiro: *See*—
Wayman, Robert W.; Kawamoto, Mutsumi; and Sakakibara, Shiro, 4,455,888, Cl. 74-689.000.
Sakamaki, Hisashi: *See*—
Komiya, Yutaka; Murakami, Katsumi; Inuzuka, Tsuneki; and Sakamaki, Hisashi, 4,456,366, Cl. 355-8.000.
Sakamoto, Seiichi: *See*—
Hiraga, Masaharu; and Sakamoto, Seiichi, 4,456,435, Cl. 417-302.000.
Sakamoto, Shinichi: *See*—
Sasayama, Takao; Amano, Matsuo; Hirayama, Takeshi; Sakamoto, Shinichi; and Miki, Masayuki, 4,455,980, Cl. 123-425.000.
Sakurai, Mitsuru: *See*—
Masaki, Nobuo; Tokuda, Hiroyuki; Furukawa, Yoshiki; Sakurai, Mitsuru; and Nitanda, Hiroshi, 4,456,362, Cl. 355-3.00R.
Salihi, Jalal T., to Otis Elevator Company. Elevator battery charging control. 4,456,097, Cl. 187-29.00R.
Salomos, Georges P. J., to Etablissements Francois Salomon Et Fils S.A. Ski boot with flex control. 4,455,768, Cl. 36-121.000.
Salter, Lowell S., Jr.; Divirgilio, Ralph F.; and Brickey, Russell A., to Morgan Construction Company. Coolant seal for rolling mill oil film bearing. 4,455,856, Cl. 72-236.000.
Salvagnini, Guido, to Salvagnini Transferica S.p.A. Forming press for bending a blank. 4,455,857, Cl. 72-320.000.
Salvagnini Transferica S.p.A.: *See*—
Salvagnini, Guido, 4,455,857, Cl. 72-320.000.
Samilov, Vladimir N.: *See*—
Paton, Boris E.; Samilov, Vladimir N.; Ivaschenko, Grigory P.; Krasjukov, Alexandr V.; and Balitsky, Vladimir M., deceased, 4,455,852, Cl. 72-82.000.
Sanden Corporation: *See*—
Hiraga, Masaharu; and Sakamoto, Seiichi, 4,456,435, Cl. 417-302.000.
Hukuhara, Seiichi, 4,456,051, Cl. 164-131.000.
Sanderson, Richard A.: *See*—
Witwer, Keith A.; Moser, Keith W.; and Sanderson, Richard A., 4,455,743, Cl. 29-596.000.
Sandhu, J. S.: *See*—
Morley, Richard M.; Multani, Jagir S.; and Sandhu, J. S., 4,456,978, Cl. 365-184.000.
Sandoz, Inc.: *See*—
Kathawala, Faizulla G., 4,456,619, Cl. 424-324.000.
Sano, Kohzoh: *See*—
Yamamoto, Yoshikazu; Sano, Kohzoh; Haneda, Kunio; and Yanagi, Toshiaki, 4,455,956, Cl. 112-274.000.
Sanraku-Ocean Co.: *See*—
Okumura, Yasushi; Okamura, Kazuhiko; Fugakawa, Yasuo; Ishikura, Tomoyuki; Kouno, Kageaki; and Lein, Joseph, 4,456,592, Cl. 424-177.000.
Sanwa Seiki Mfg. Co., Ltd.: *See*—
Koyanagi, Yuzo, 4,455,867, Cl. 73-119.00A.
Saramaki, Kari: *See*—
Marttala, Tapani; and Saramaki, Kari, 4,456,750, Cl. 536-59.000.
Sasaki, Takao: *See*—
Imazeki, Ryoji; Yamazaki, Etsuo; and Sasaki, Takao, 4,456,864, Cl. 318-578.000.
Sasaki, Yasuharu: *See*—
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; and Sugihara, Taisuke, 4,456,757, Cl. 546-139.000.
Sasaki, Yasuhiro: *See*—
Toyoshima, Yohtaro; Sasaki, Yasuhiro; and Uchida, Minoru, 4,456,900, Cl. 336-221.000.
Sasanuma, Kiyoshi: *See*—
Kishi, Norimasa; Sasanuma, Kiyoshi; Takeuchi, Yasuhisa; and Kato, Shinichi, 4,456,903, Cl. 340-54.000.
Sasayama, Takao; Amano, Matsuo; Hirayama, Takeshi; Sakamoto, Shinichi; and Miki, Masayuki, to Hitachi, Ltd. Engine combustion control method. 4,455,980, Cl. 123-425.000.
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, to Eisai Co., Ltd.; and General Director of the Agency of Industrial Science and Technology. Polyprenyl ketone derivatives. 4,456,558, Cl. 260-413.000.
Sato, Fumitaka: *See*—
Mohrman, Edward A.; Umeno, Tsunetaka; and Sato, Fumitaka, 4,456,952, Cl. 364-200.000.
Sato, Hiroshi: *See*—
Tamura, Mitsuhisa; and Sato, Hiroshi, 4,456,562, Cl. 260-465.00F.
Sato, Hiroyuki: *See*—
Nambu, Junji; Yoshino, Kenji; Ariga, Nagao; Shimazu, Kyotaro; and Sato, Hiroyuki, 4,456,732, Cl. 525-65.000.
Sato, Takateru; and Shiba, Haruo, to TDK Electronics Co., Ltd. Magnetic tape clamping device. 4,456,192, Cl. 242-74.100.
Sato, Tsunehiko: *See*—
Takeda, Hideo; and Sato, Tsunehiko, 4,456,637, Cl. 427-355.000.
Sato, Yasuhisa, to Canon Kabushiki Kaisha. Light receiving apparatus for use in single-lens reflex camera. 4,456,352, Cl. 354-429.000.
Sato, Yasuo; and Sakai, Takamasa, to Clarion Co., Ltd. Variable capacitor. 4,456,917, Cl. 357-14.000.
Sato, Yukio, to Canon Kabushiki Kaisha. Copying machine with automatic document feeder. 4,456,369, Cl. 355-14.05H.
Satta, Giuseppe: *See*—
Merlini, Luigi; Bassi, Aldo; and Satta, Giuseppe, 4,455,984, Cl. 123-481.000.

Sauber, Charles J. Wall mountable cable terminal block. 4,456,326, Cl. 339-272.00A.
Saunders, Gerald A. B.: *See*—
Wevers, Henk W.; Sorbie, Charles; and Saunders, Gerald A. B., 4,456,006, Cl. 128-92.00B.
Saurer-Allma GmbH: *See*—
Mehta, Atul, 4,455,817, Cl. 57-18.000.
Sauter, Hubert; Ammermann, Eberhard; Rentzea, Costin; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. Azole compounds, their preparation, and fungicides which contain these compounds. 4,456,608, Cl. 424-269.000.
Savage, Patric, to Shell Oil Company. Associative memory system. 4,456,976, Cl. 365-49.000.
Savell, Harvey E. Impact wrench. 4,455,899, Cl. 81-466.000.
Savery, Winsor T.: *See*—
Heim, Werner; Wolf, Fritz J.; and Savery, Winsor T., 4,456,065, Cl. 166-248.000.
Sawada, Takao: *See*—
Komine, Yoshiharu; and Sawada, Takao, 4,456,902, Cl. 338-34.000.
Scapecchi, Pier L.: *See*—
Messori, Pier P.; and Scapecchi, Pier L., 4,456,314, Cl. 308-236.000.
Schade, Otto H., Jr., to RCA Corporation. Circuitry for generating non-overlapping pulse trains. 4,456,837, Cl. 307-262.000.
Schafer, Karl: *See*—
Walz, Klaus; Schafer, Karl; Hoffarth, Gunther; and Schulze, Hans, 4,456,554, Cl. 260-403.000.
Schafer, Rolf. Wound healing glycoside compositions. 4,456,596, Cl. 424-180.000.
Schaffner, Alfred C., to Westinghouse Electric Corp. Shaft rounding apparatus. 4,456,516, Cl. 204-217.000.
Schapel, Dietmar: *See*—
Burgdorfer, Hans-Heribert; Schapel, Dietmar; Schneider, Gottfried; von Bonin, Wulf; and von Gizycki, Ulrich, 4,456,642, Cl. 428-68.000.
Schaub, Thomas, to LGZ Landis & Gyr Zug AG. Method and apparatus for enhancing the probability of error-free reception of digital signals. 4,456,992, Cl. 371-6.000.
Schaub, Uwe: *See*—
Weigle, Dieter; Zirps, Wilhelm; and Schaub, Uwe, 4,456,170, Cl. 236-84.000.
Scher, Herbert B.: *See*—
Rodson, Marius; and Scher, Herbert B., 4,456,569, Cl. 264-4.700.
Scherer, Matthias: *See*—
Wagner, Wolfgang; Scherer, Matthias; Wegehaupt, Karl-Heinrich; and Frey, Volker, 4,456,542, Cl. 252-8.600.
Scherer, Robert: *See*—
Mathgen, Georges; Scherer, Robert; Prum, Charles; and Leick, Roger, 4,457,002, Cl. 373-95.000.
Schering Aktiengesellschaft: *See*—
Brinkmann, Bernd; and Lucas, Hermann-Josef, 4,456,718, Cl. 524-114.000.
Laurent, Henry; and Wiechert, Rudolf, 4,456,620, Cl. 424-331.000.
Schering, Aktiengesellschaft (A.G.): *See*—
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,456,600, Cl. 424-238.000.
Schering Corporation: *See*—
McCombie, Stuart W., 4,456,609, Cl. 424-270.000.
Schetina, Otto: *See*—
Wrulich, Herwig; Zitz, Alfred; Schetina, Otto; and Gekle, Siegmar, 4,456,306, Cl. 299-81.000.
Schibinger, Joseph S.: *See*—
DeSantis, Alfred J.; and Schibinger, Joseph S., 4,456,958, Cl. 364-200.000.
Schieltz, Steven W., to NCR Corporation. Apparatus using a decision table for routing data among terminals and a host system. 4,456,957, Cl. 364-200.000.
Schiffer, Gunter, to Eduard Kusters Maschinenfabrik. Apparatus for forming patterns in materials such as textile goods. 4,455,845, Cl. 68-204.000.
Schihl, Raymond J.: *See*—
Palmer, Guy V.; and Schihl, Raymond J., 4,456,121, Cl. 198-750.000.
Schillinger, Rainer; Rühl, Karl; Kemmner, Ulrich; and Schuler, Hans, to Robert Bosch GmbH. Rotary fuel supply unit with matched materials for the rollers and running track. 4,456,436, Cl. 417-366.000.
Schindler, Rudolf: *See*—
Doellinger, Rolf; and Schindler, Rudolf, 4,456,495, Cl. 156-166.000.
Schingnitz, Manfred: *See*—
Kretschmer, Horst; Fleischer, Klaus; Gohler, Peter; Schingnitz, Manfred; Berger, Friedrich; Jegorow, Aleksander; Fedotov, Vasilij; Gavrilin, Vladimir; Gudymov, Ernest; Semenov, Vladimir; Achmatov, Igol; Majdurov, Nikolaj; and Avraamov, Evgenij, 4,455,949, Cl. 110-263.000.
Schjeldahl, Gilmore T.; and Sharma, B., to Angiomedics Corporation. Expandable occlusion apparatus. 4,456,000, Cl. 128-1.00D.
Schlein, Seymour N. Anchor nail fastener having chisel point. 4,456,416, Cl. 411-358.000.
Schleusener, Annerose: *See*—
Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, 4,456,600, Cl. 424-238.000.
Schlich, Elmar: *See*—
Botzem, Werner; Laug, Reiner; Kroll, Hartmut; Schlich, Elmar; Anspach, Walter; Brendel, Karl; and Srostlik, Peter, 4,456,827, Cl. 250-506.100.
Schlosser, Philip A.; and Quayle, Stanley F., to Scriptel Corporation. Electrographic system and method. 4,456,787, Cl. 178-19.000.
Schlumberger Technology Corporation: *See*—
Guimard, Andre ; and Lemarchand, Jacques, 4,455,875, Cl. 73-708.000.
Schmid, Helmut: *See*—
Schonfelder, Manfred; Steinberger, Helmut; and Schmid, Helmut, 4,456,647, Cl. 428-216.000.
Schmid, Wolfgang; Wanner, Karl; Faichle, Jorg; Bleicher, Manfred; and Muller, Frank, to Robert Bosch GmbH. Power-driven hand tool. 4,456,076, Cl. 173-116.000.
Schmidt, Thomas: *See*—
Bonse, Gerhard; and Schmidt, Thomas, 4,456,769, Cl. 564-226.000.
Schmitt, Donald J., to Therm-O-Disc, Incorporated. Adjustable thermostat. 4,455,886, Cl. 74-531.000.
Schmitz, Eckehard: *See*—
Sudbeck, Rainer; Baumgartner, Hans; and Schmitz, Eckehard, 4,455,987, Cl. 123-569.000.
Schmitz, Heinz, to Rose Verpackungsmaschinenfabrik Theegarten GmbH & Co. Apparatus for parting-off pieces, particularly candy, from a strand of material, particularly a soft plastic strand of material. 4,455,902, Cl. 83-150.000.
Schmitz, Henry; Kaneko, Takushi; Essery, John M.; and Doyle, Terrence W., to Bristol-Myers Company. Trichothec-9-ene-3,4,15-triol,12,13-epoxy-3-chloroacetate useful as an anti-tumor agent. 4,456,765, Cl. 549-332.000.
Schneider, Arthur, to Volkswagenwerk Aktiengesellschaft. Drive for a vehicle equipped with a brake. 4,456,106, Cl. 192-0.055.
Schneider, Erich: *See*—
Ratzel, Rudiger; and Schneider, Erich, 4,456,861, Cl. 318-568.000.
Schneider, Gottfried: *See*—
Burgdorfer, Hans-Heribert; Schapel, Dietmar; Schneider, Gottfried; von Bonin, Wulf; and von Gizycki, Ulrich, 4,456,642, Cl. 428-68.000.
Schneider, Lutz; and Guigas, Bruno, to Bruker Analytische Messtechnik GmbH. Transferring data between memory and magnetic storage. 4,456,933, Cl. 360-49.000.
Schoen, Jerry W.: *See*—
Neiheisel, Gary L.; and Schoen, Jerry W., 4,456,812, Cl. 219-121.0LM.
Schoeps, Jochen: *See*—
Dhein, Rolf; Backer, Lothar; and Schoeps, Jochen, 4,456,729, Cl. 524-542.000.
Schoettle, Klaus; Ilmer, Andreas; and Flohr, Joachim, to BASF Aktiengesellschaft. Guide device for a recording medium in tape form, especially a magnetic tape. 4,456,160, Cl. 226-195.000.
Schonfelder, Manfred; Steinberger, Helmut; and Schmid, Helmut, to Bayer Aktiengesellschaft. Plastics mouldings finished with a three-layer coating and a process for producing the finish. 4,456,647, Cl. 428-216.000.
Schoofs Incorporated: *See*—
Schoofs, Richard J., 4,455,796, Cl. 52-172.000.
Schoofs, Richard J., to Schoofs Incorporated. Insulating glass unit and spacer bar therefor. 4,455,796, Cl. 52-172.000.
Schoonover, Larry G., to Dresser Industries, Inc. System and method for visual display of well logging data. 4,456,983, Cl. 367-69.000.
Schott International, Inc.: *See*—
Kalal, John D., 4,456,122, Cl. 206-45.340.
Schub, Leonard. Automatic battery charger. 4,456,869, Cl. 320-38.000.
Schubert, Peter; Pfeifer, Hermann; Hermann, Volker; Keller, Reimund; and Schulz, Eckhard, to SICOWA Verfahrenstechnik fur Baustoffe GmbH & Co. KG. Apparatus for the production of calcium silicate-containing stone blanks useful in constructing building walls. 4,456,449, Cl. 425-253.000.
Schubert & Salzer: *See*—
Goldammer, Georg; Mahrt, Gunter; and Dammig, Joachim, 4,455,714, Cl. 19-81.000.
Schukin, Valery Y.: *See*—
Ermolovich, Vyacheslav I.; Klushin, Valery A.; Sadko, Vladimir I.; and Schukin, Valery Y., 4,455,854, Cl. 72-90.000.
Schuler, Hans: *See*—
Schillinger, Rainer; Ruhl, Karl; Kemmner, Ulrich; and Schuler, Hans, 4,456,436, Cl. 417-366.000.
Schulz, Eckhard: *See*—
Schubert, Peter; Pfeifer, Hermann; Hermann, Volker; Keller, Reimund; and Schulz, Eckhard, 4,456,449, Cl. 425-253.000.
Schulz, Kurt; and Maglica, Peter, to Carl Zeiss-Stiftung. Apparatus for examining eyes. 4,456,348, Cl. 351-212.000.
Schulze, Hans: *See*—
Walz, Klaus; Schafer, Karl; Hoffarth, Gunther; and Schulze, Hans, 4,456,554, Cl. 260-403.000.
Schumacher, Berthold W.; and Dilay, Walter, to Ford Motor Company. Adaptive schedule selective weld control. 4,456,810, Cl. 219-110.000.
Schumacher, Karl: *See*—
Harter, Walter; and Schumacher, Karl, 4,456,418, Cl. 414-351.000.
Schumann, Frank; Richter, Hans-Jurgen; Stiefel, Werner; and Fritzsche, Klaus, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Process for the determination of thickness of adhesive layers of inner book block backings. 4,456,379, Cl. 356-381.000.
Schuster, Erich: *See*—
Fritsche, Rainer; Jacoby, Hans-Dieter; and Schuster, Erich, 4,455,755, Cl. 33-174.00L.
Schwartz, William H. Plunger alignment fitting and method for cold chamber die casting machine. 4,455,757, Cl. 33-181.00R.
Schwarz, Herbert: *See*—
Findeisen, Kurt; and Schwarz, Herbert, 4,456,565, Cl. 260-545.00R.

Schwarzmann, Matthias: *See*—
Marosi, Laszlo; Stabenow, Joachim; and Schwarzmann, Matthias, 4,456,582, Cl. 423-277.000.
Schweitzer, Edmund O., Jr. Cable mounted magnetic core assembly. 4,456,873, Cl. 324-51.000.
Schweizer, Riccardo. Heat accumulating hot plate for the preparation and cooking of food. 4,455,927, Cl. 99-425.000.
Schwieters, Clarence R.: *See*—
Baasch, Holger J.; Bishop, Ross W.; Charlson, Paul M.; Hunzeker, James G.; and Schwieters, Clarence R., 4,456,938, Cl. 360-109.000.
Sciortino, August M. Break-away security means for self-locking covered coin receptacle. 4,456,165, Cl. 232-15.000.
Sciortino, George J., to Venturon Corporation, Inc. Water dispensing system. 4,456,149, Cl. 222-1.000.
Scitex Corporation Ltd.: *See*—
Rosenfeld, Gideon, 4,456,924, Cl. 358-75.000.
Scott, Daniel G.; and Ferry, Gene S., to American Standard Inc. Spring-locking handle mechanism. 4,456,219, Cl. 251-99.000.
Scrantom, DeHart G., to AVX Corporation. High speed apparatus for inserting electronic components into printed circuit boards. 4,455,735, Cl. 29-564.100.
Screen, Stafford T., to British Castors Limited. Castor with braking means. 4,455,707, Cl. 16-35.00R.
Scriptel Corporation: *See*—
Schlosser, Philip A.; and Quayle, Stanley F., 4,456,787, Cl. 178-19.000.
Seagate Technology: *See*—
Iftikar, Syed H.; and Reeck, David L., 4,456,937, Cl. 360-106.000.
Sealtran Corporation: *See*—
Drower, Herbert M.; and Minkus, Morton, 4,456,639, Cl. 428-13.000.
Sebag, Henri: *See*—
Vanlerberghe, Guy; Sebag, Henri; and Pierre, Rene, 4,456,586, Cl. 424-70.000.
Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, The: *See*—
Murray, John; and Tobias, Robert W., 4,455,942, Cl. 102-444.000.
Seefluth, Uwe C. Cartesian toy with rotary movement imparting contact structure. 4,455,782, Cl. 446-155.000.
Seeliger, Christian: *See*—
Henneberger, Helga; Seeliger, Christian; and Wisser, Siegfried, 4,456,951, Cl. 364-131.000.
Segarra, Gerard, to U.S. Philips Corporation. Remote simulation by remote control from a computer desk. 4,456,994, Cl. 371-16.000.
Seibert, Gerhard. Winding machine for winding strand-shaped winding material on a spool. 4,456,199, Cl. 242-158.00R.
Seiki, Kazuo: *See*—
Suzuki, Yoshihisa; and Seiki, Kazuo, 4,455,819, Cl. 57-404.000.
Seip, Hermann, to Alfred Teves GmbH. Mechanically controlled power brake unit. 4,455,829, Cl. 60-547.100.
Seitzer, Walter H., to Suncor, Inc. Recovery of bitumen from bituminous oil-in-water emulsions. 4,456,533, Cl. 210-708.000.
Sekisui Kaseihin Kogyo Kabushiki Kaisha: *See*—
Fukumura, Mikio; Shibata, Hideo; Doi, Shuhei; Isaka, Tsutomu; and Inoue, Takayuki, 4,456,704, Cl. 521-79.000.
Selfix, Inc.: *See*—
Chap, John P., 4,456,125, Cl. 206-513.000.
Semenov, Vladimir: *See*—
Kretschmer, Horst; Fleischer, Klaus; Gohler, Peter; Schingnitz, Manfred; Berger, Friedrich; Jegorow, Aleksander; Fedotov, Vasilij; Gavrilin, Vladimir; Gudymov, Ernest; Semenov, Vladimir; Achmatov, Igol; Majdurov, Nikolaj; and Avraamov, Evgenij, 4,455,949, Cl. 110-263.000.
Senger, Donald R.: *See*—
Dvorak, Harold F.; and Senger, Donald R., 4,456,550, Cl. 260-112.00R.
Sentrol, Inc.: *See*—
Holce, Thomas J.; and Huckins, Charles M., 4,456,897, Cl. 335-205.000.
Sepp, Gunther; and Dyrna, Peter, to Messerschmitt-Bolkow-Blohm GmbH. Housing system for a laser. 4,457,001, Cl. 372-59.000.
Seynhaeve, Andre G., to Societe Delsey. Piece of luggage, more especially a suitcase or document case. 4,456,105, Cl. 190-115.000.
Shaffer, Mary E.: *See*—
Benjamin, Mary L.; Dobbs, Robert J.; and Shaffer, Mary E., 4,456,484, Cl. 75-252.000.
Shapiro, Wilbur; and Bupara, Sargit S., to Cummins Engine Company, Inc. Gas bearing piston assembly. 4,455,974, Cl. 123-47.00R.
Sharma, B.: *See*—
Schjeldahl, Gilmore T.; and Sharma, B., 4,456,000, Cl. 128-1.00D.
Sharon, Harold M., to United Technologies Corporation. Engine fan case grinder. 4,455,787, Cl. 51-241.00S.
Sharp, Maurice L.: *See*—
Rolf, Richard L.; and Sharp, Maurice L., 4,456,517, Cl. 204-286.000.
Shaturov, Gennady F.; and Malyavko, Sergei S., to Mogilevskoe Otdelenie Fizikotekhnicheskogo Instituta Akademii Nauk Belorusskoi SSR. Rotary cutting tool. 4,456,407, Cl. 407-7.000.
Shaw, Edwin L.; and Viles, Alan H., to Abex Corporation. Rocker cam control. 4,455,920, Cl. 92-12.200.
Shaw, H. John; and Pavlath, George A., to Leland Stanford Jr. Univ., The Board of Trustees of. Multimode fiber optic rotation sensor. 4,456,377, Cl. 356-350.000.
Shaw, Robert L.: *See*—
Maes, Michel E.; Shaw, Robert L.; and Reinsch, Royal L., 4,456,494, Cl. 149-21.000.
Shedigian, Vandos, to Emhart Industries, Inc. Capacitor. 4,456,945, Cl. 361-305.000.
Sheehan, John C.; and Lo, Young S., to Massachusetts Institute of Technology. 7-Oxygen analogs of cephalosporins. 4,456,755, Cl. 544-23.000.
Shell Oil Company: *See*—
Brownscombe, Thomas F., 4,456,698, Cl. 502-203.000.
Grimsby, Frank N., 4,456,556, Cl. 260-412.400.
Grimsby, Frank N., 4,456,557, Cl. 260-412.400.
Savage, Patric, 4,456,976, Cl. 365-49.000.
Van der Burgt, Maarten J., 4,456,546, Cl. 252-373.000.
Shen, Chung-Shan. Mechanism for water valve. 4,456,222, Cl. 251-230.000.
Sherman, John D.; and Chao, Chien C., to Union Carbide Corporation. Bulk separation of polyhydric alcohols by selective adsorption on zeolitic molecular sieves. 4,456,774, Cl. 568-872.000.
Sherry, Howard S.: *See*—
Oleck, Stephen M.; and Sherry, Howard S., 4,456,700, Cl. 502-220.000.
Sherwood, William L. Continuous steelmaking and casting. 4,456,476, Cl. 75-46.000.
Shiba, Haruo: *See*—
Sato, Takateru; and Shiba, Haruo, 4,456,192, Cl. 242-74.100.
Shiba, Keisuke: *See*—
Nakayama, Takao; Ohishi, Chikashi; Nakao, Sho; and Shiba, Keisuke, 4,456,670, Cl. 430-49.000.
Shibata, Hideo: *See*—
Fukumura, Mikio; Shibata, Hideo; Doi, Shuhei; Isaka, Tsutomu; and Inoue, Takayuki, 4,456,704, Cl. 521-79.000.
Shibata, Sueji; and Umesato, Shoji, to Yamaichi Electric Mfg. Co., Ltd.; and Nippon Electric Co., Ltd. IC Socket. 4,456,318, Cl. 339-17.0CF.
Shibuya, Chisei: *See*—
Murakami, Masahiro; Kobayashi, Masateru; Yamamoto, Kimiyo; and Shibuya, Chisei, 4,456,754, Cl. 544-21.000.
Shiets, Leo C., to Axle Surgeons, Inc. Method and apparatus for rebuilding vehicle axles. 4,455,732, Cl. 29-402.060.
Shigemura, Yutaka; Hisajima, Masahiko; Kimura, Hiroshi; Yada, Isao; Irie, Yoichiro; Morimoto, Kiyoshi; and Nagashima, Takashi, to Mita Industrial Co., Ltd. Transfer-type electrostatic copying method. 4,456,673, Cl. 430-125.000.
Shigetoyo Yasui: *See*—
Ishida, Kenichi, 4,456,047, Cl. 152-213.00A.
Shim, Joosup, to Mobil Oil Corporation. Triazole-dithiophosphate reaction product and lubricant compositions containing same. 4,456,539, Cl. 252-46.700.
Shimada, Kenji: *See*—
Kubota, Misao; Terao, Kazuhiko; and Shimada, Kenji, 4,456,531, Cl. 210-409.000.
Shimano Industrial Company Limited: *See*—
Noda, Hideo, 4,456,194, Cl. 242-84.20A.
Shimazu, Kyotaro: *See*—
Nambu, Junji; Yoshino, Kenji; Ariga, Nagao; Shimazu, Kyotaro; and Sato, Hiroyuki, 4,456,732, Cl. 525-65.000.
Shimizu, Hirokazu: *See*—
Sugino, Takashi; Itoh, Kunio; Wada, Masaru; and Shimizu, Hirokazu, 4,456,999, Cl. 372-45.000.
Shimizu, Takao: *See*—
Mizuno, Takaji; Shimizu, Takao; and Kato, Yoshiaki, 4,456,814, Cl. 219-137.710.
Shimizu, Takeshi, to Juridical Foundation The Chemo-Sero-Therapeutic Research Institute, Nippon Vaccine Co., Ltd.; and Shimizu, Takeshi. Method of the preparation of improved mutant strain of *Bordetella bronchiseptica* useful as live attenuated vaccine for prophlaxis of *B. bronchiseptica* infection. 4,456,588, Cl. 424-92.000.
Shimizu, Tetsuo: *See*—
Tomita, Katsuhiko; Shimizu, Tetsuo; and Bandoh, Masaichi, 4,456,919, Cl. 357-28.00A.
Shimizu, Yukio: *See*—
Konishi, Toshiharu; Honda, Zenzo; Hori, Yutaka; Shimizu, Yukio; and Okada, Hideyuki, 4,456,652, Cl. 428-344.000.
Shimoda, Shinichi: *See*—
Murakami, Katsuyuki; Hirakata, Kaoru; Ishizaka, Fumio; Shimoda, Shinichi; and Itai, Reiichi, 4,456,510, Cl. 204-101.000.
Shimoni, Moshe: *See*—
Cais, Michael; and Shimoni, Moshe, 4,456,690, Cl. 436-500.000.
Shimotsuma, Wataru: *See*—
Yubakami, Keiichi; Takashima, Yuji; and Shimotsuma, Wataru, 4,456,669, Cl. 430-45.000.
Shin-Etsu Chemical Co., Ltd.: *See*—
Eguchi, Yoshitugu; Matsumoto, Osamu; and Imada, Kiyoshi, 4,456,572, Cl. 264-53.000.
Shinaver, Lawrence P., to Applied Diesel Engineering, Inc. Filter device for diesel engines. 4,456,529, Cl. 210-306.000.
Shinbori, Takeyoshi; and Matsuoka, Susumu, to NHK Spring Co., Ltd. Apparatus for controlling friction between leaf springs of a laminated leaf spring assembly. 4,456,232, Cl. 267-54.00B.
Shinke, Osamu: *See*—
Taniguchi, Shozo; Shinke, Osamu; Ishii, Masami; and Kubo, Shinichi, 4,456,993, Cl. 371-10.000.
Shinohara, Mitsuharu: *See*—
Nakagawa, Sadayoshi; and Shinohara, Mitsuharu, 4,456,796, Cl. 179-111.00E.

Shinsei Kogyo Co., Ltd.: *See*—
Nagano, Toshiaki, 4,455,783, Cl. 446-71.000.

Shiojiri, Hiroyuki: *See*—
Yamatsu, Isao; Imai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, 4,456,603, Cl. 424-248.570.

Shionogi & Co., Ltd.: *See*—
Tanaka, Kentaro; Kondo, Eiji; Matsumoto, Kouichi; Shoji, Jun'ichi; and Tsuji, Naoki, 4,456,686, Cl. 435-119.000.

Shiozawa, Kazuo, to Konishiroku Photo Industry Co., Ltd. Program type exposure controlling device. 4,456,361, Cl. 354-443.000.

Shirakami, Toshiharu: *See*—
Kawai, Yoshio; and Shirakami, Toshiharu, 4,456,513, Cl. 204-180.00R.

Shoebotham, Neville M., to Fluidised Bed Combustion (Proprietary) Limited. Two stage coal gasification plant. 4,456,455, Cl. 48-85.200.

Shoji, Jun'ichi: *See*—
Tanaka, Kentaro; Kondo, Eiji; Matsumoto, Kouichi; Shoji, Jun'ichi; and Tauji, Naoki, 4,456,686, Cl. 435-119.000.

Shoji, Mitihiro: *See*—
Mikiya, Toshio; Shoji, Mitihiro; and Tanoi, Tadao, 4,456,410, Cl. 408-76.000.

Shomura, Eiichi: *See*—
Takenoya, Hideaki; Inamori, Mikio; and Shomura, Eiichi, 4,455,953, Cl. 112-262.100.

Shook, Richard G., to General Dynamics, Pomona Division. Shock wave end cap removal device. 4,455,917, Cl. 89-1.817.

Shopsmith, Inc.: *See*—
Clark, Donald L.; and Legler, John G., 4,456,042, Cl. 144-129.000.

Shu, Winston R., to Mobil Oil Corporation. Visbreaking-enhanced thermal recovery method utilizing high temperature steam. 4,456,066, Cl. 166-272.000.

Sibille, Jacques R.: *See*—
Allard, Paul L.; and Sibille, Jacques R., 4,456,003, Cl. 128-80.00F.

SICOWA Verfahrenstechnik fur Baustoffe GmbH & Co. KG: *See*—
Schubert, Peter; Pfeifer, Hermann; Hermann, Volker; Keller, Reimund; and Schulz, Eckhard, 4,456,449, Cl. 425-253.000.

Siebourg, Wolfgang: *See*—
Rottmaier, Ludwig; Merten, Rudolf; Siebourg, Wolfgang; and Lachmann, Burkhard, 4,456,715, Cl. 524-100.000.

Siedenstrang, Roy W.; and Thorsrud, Agmund K., to Phillips Petroleum Company. Molding compounds, sponge articles produced therefrom and process of production. 4,456,706, Cl. 521-89.000.

Siemens Aktiengesellschaft: *See*—
Forster, Helmut, 4,456,826, Cl. 250-370.000.
Haeusler, Jochen; Friemert, Horst; and Kutchukian, Remi, 4,456,292, Cl. 294-65.500.
Henneberger, Helga; Seeliger, Christian; and Wisser, Siegfried, 4,456,951, Cl. 364-131.000.
Krueger, Hans; and Rehme, Hans, 4,456,515, Cl. 204-192.00P.
Pollmeier, Franz-Josef; and Ihlein, Walter, 4,456,651, Cl. 428-324.000.

Siemens-Allis, Inc.: *See*—
Stich, Frederick A., 4,456,871, Cl. 323-217.000.

Siemens Gammasonics, Inc.: *See*—
Pollock, Robert W., 4,456,487, Cl. 134-31.000.

SIG - Schweizerische Industrie-Gesellschaft: *See*—
Netzhammer, Peter, 4,455,808, Cl. 53-373.000.

Sills, Terrence J. Modified annual cycle energy system. 4,456,056, Cl. 165-45.000.

Silvy, Dorrel R.; and Stania, William J., to Magnetic Peripherals Inc. Modulation system for optical recording. 4,456,981, Cl. 365-234.000.

Simon, Jacques: *See*—
Henry, Raymond; Simon, Jacques; Levy, Daniele; Carpenter, Jean-Francois; and Defaut, Bernard, 4,456,334, Cl. 350-320.000.

Simonotti, Lucio; and Ricca, Aldo, to Ing. C. Olivetti & C., S.p.A. Banknote dispensing machine with delivery device for the receipt for the banknotes dispensed. 4,456,234, Cl. 270-18.000.

Singer, Arnold M.: *See*—
Oliver, John E., Jr.; and Singer, Arnold M., 4,456,537, Cl. 252-8.55R.

Singer Company, The: *See*—
Lauritsen, Richard L.; and Kozerski, David W., 4,456,801, Cl. 200-83.00P.

Single-Ply Institute of America, Inc.: *See*—
Francovitch, Thomas F., 4,455,804, Cl. 52-698.000.

Siol, Werner; Fink, Herbert; Klesse, Wolfgang; Rauch, Hubert; and Suetterlin, Norbert, to Rohm GmbH. Method for making aqueous dispersions of a synthetic resin. 4,456,726, Cl. 524-501.000.

Sjosward, Lars E. G. Sports shoe soles. 4,455,765, Cl. 36-30.00R.

Skaiaa, Leif, to Elkem a/s. Means for splitting carcasses. 4,455,712, Cl. 17-23.000.

Skerlos, Peter C.; Zato, Thomas J.; and Templin, Frank C., to Zenith Radio Corporation. Television/telephone system with automatic dialing. 4,456,925, Cl. 358-85.000.

Smirlock, Martin E.: *See*—
Burrill, Charles E., Jr.; Smirlock, Martin E.; and Krepchin, Ira P., 4,456,068, Cl. 166-303.000.

Smith, Barry W.; and Hudson, Anthony J., to Broken Hill Proprietary Company Limited, The. Furnace cooling elements and method of forming furnace cooling elements. 4,455,733, Cl. 29-421.00R.

Smith, Francis S.; and Gould, Jack, to Imperial Chemical Industries Limited. Process for forming a continuous filament yarn from a melt spinnable synthetic polymer. 4,456,575, Cl. 264-176.00F.

Smith International, Inc.: *See*—
Harrison, Simon J., 4,456,082, Cl. 175-384.000.

Smith, James M.: *See*—
Robertson, John W., Jr.; and Smith, James M., 4,456,865, Cl. 318-599.000.

Smith, Richard H.: *See*—
Bly, Kenneth B.; Ludecke, Otto A.; and Smith, Richard H., 4,455,823, Cl. 60-311.000.

Smith, Robert S. Exerciser for runners. 4,456,248, Cl. 272-134.000.

Smith, Roger D., to Cincinnati Milacron Inc. Carrier with exchangeable chuck. 4,456,447, Cl. 425-182.000.

SmithKline Beckman Corporation: *See*—
Pfeiffer, Francis R., 4,456,594, Cl. 424-177.000.

Snaidr, Stanislav M.: *See*—
Brackmann, Warren A.; and Snaidr, Stanislav M., 4,456,018, Cl. 131-116.000.

Snappe, Roger: *See*—
Travers, Christine; Trinh Dinh, Chan; Snappe, Roger; and Bournonville, Jean-Paul, 4,456,775, Cl. 568-885.000.

Snider, Glenn R.: *See*—
Landt, Harvey L.; and Snider, Glenn R., 4,456,895, Cl. 333-174.000.

Snitgen, Joseph D. Hydraulic power unit. 4,455,828, Cl. 60-547.100.

Snitman, David L.: *See*—
Nakane, Masami; Snitman, David L.; Reid, Joyce; and Haslanger, Martin F., 4,456,615, Cl. 424-285.000.

Snorkel Stove Co.: *See*—
Evans, Hawley R.; and Howe, Charles B., 4,455,997, Cl. 126-367.000.

Snyder, Paul V.: *See*—
Krasznai, Charles Z.; and Snyder, Paul V., 4,456,820, Cl. 219-398.000.

Snyder, Steven A.; and Reeve, Gary L., to Coachmen Industries, Inc. Running board construction. 4,456,275, Cl. 280-163.000.

Socia, Lauralee A.: *See*—
Lyman, Joseph A., 4,455,970, Cl. 122-20.00B.

Societe Anonyme DBA: *See*—
Muscat, Gerard, 4,456,103, Cl. 188-326.000.

Societe Delsey: *See*—
Seynhaeve, Andre G., 4,456,105, Cl. 190-115.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See*—
Bayle-Laboure, Gerard J. P.; Buisson, Mark F. B.; Linstrumelle, Roger B.; and Pachot, Jean-Claude, 4,455,822, Cl. 60-39.822.
Lissajoux, Pierre J.; and Rigo, Marcel L., 4,455,887, Cl. 74-573.00R.

Societe Suisse pour l'Industrie Horlogere Management Services S.A.: *See*—
Dellea, Mario, 4,456,386, Cl. 368-201.000.

Solomon, Frank; and Gran, Charles, to Diamond Shamrock Corporation. Three layer laminate. 4,456,521, Cl. 204-292.000.

Somemiya, Akiyoshi: *See*—
Miyashita, Shunitsu; Azuma, Masaaki; and Somemiya, Akiyoshi, 4,456,736, Cl. 525-392.000.

Someshwar, Ashok H.: *See*—
Graber, Warren S.; and Someshwar, Ashok H., 4,456,965, Cl. 364-900.000.

Sommargren, Gary E., to United States of America, Energy. Laser heterodyne surface profiler. 4,456,339, Cl. 350-403.000.

Sone, Masazumi: *See*—
Endo, Hiroshi; Sone, Masazumi; Imai, Iwao; and Ishikawa, Yasuki, 4,455,989, Cl. 123-620.000.

Sone, Takanori: *See*—
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; and Sugihara, Taisuke, 4,456,757, Cl. 546-139.000.

Sony Corporation: *See*—
Fukuda, Joji; and Okubo, Yutaka, 4,456,971, Cl. 364-900.000.
Hashimoto, Yoshitaka, 4,456,930, Cl. 358-328.000.
Odaka, Kentaro, 4,456,905, Cl. 340-347.0DD.

Sorbie, Charles: *See*—
Wevers, Henk W.; Sorbie, Charles; and Saunders, Gerald A. B., 4,456,006, Cl. 128-92.00B.

Sorenson, John E.: *See*—
Miner, David W.; Driscoll, Mark D.; Sorenson, John E.; Kirchner, Robert T.; and Keech, David A., 4,456,173, Cl. 237-67.000.

Sotax AG: *See*—
Benz, Reinhard, 4,456,325, Cl. 339-256.0RT.

Southern California Edison Company: *See*—
Greer, Richard H.; and Newport, James B., 4,456,832, Cl. 307-38.000.

Southwire Company: *See*—
Adams, Ronald D.; and Chia, E. Henry, 4,456,491, Cl. 148-2.000.

Soyack, Richard F. J., to Bell Telephone Laboratories, Incorporated. Automated hardware inventory system. 4,456,790, Cl. 179-18.0ES.

Spars, Byron G.; Tamm, Paul W.; and Wallman, P. Henrik, to Chevron Research Company. Reactor vessel and process for thermally treating a granular solid. 4,456,504, Cl. 201-12.000.

Spars, Byron G.; Klett, Robert J.; and Wallman, P. Henrik, to Chevron Research Company. Process for coking contaminated pyrolysis oil on heat transfer material. 4,456,525, Cl. 208-11.00R.

Speck-Kolbenpumpen-Fabrik: *See*—
Wolff, Horst, 4,456,439, Cl. 417-454.000.

Speckhart, Frank H.; and Higdon, Dennis W. Drag race reaction timer. 4,456,383, Cl. 368-9.000.

Spence, Gavin G.: *See*—
Maslanka, William W.; and Spence, Gavin G., 4,456,724, Cl. 524-458.000.

Sperling, Friedrich; and Hennecke, Aloys, to Accumulatorenwerk Hoppecke Carl Zoellner & Sohn GmbH & Co. KG. Casting machine for grids of lead storage batteries. 4,455,724, Cl. 29-2.000.

Sperry Corporation: *See*—
Brelsford, John E.; and Glass, Emmett F., 4,455,922, Cl. 91-358.00A.
Maine, Reuben E., 4,457,006, Cl. 375-87.000.
Rao, B. Rama; and Susman, Leon, 4,456,913, Cl. 343-361.000.
Stein, Barry F.; and Young, Peter L., 4,456,506, Cl. 204-15.000.

Spiering, Abraham A.: *See*—
Gozeling, Jacobus A.; de Boer, Sibbele; and Spiering, Abraham A., 4,456,083, Cl. 175-415.000.

Spietschka, Ernst; and Urban, Manfred, to Hoechst Aktiengesellschaft. Process for the preparation of 4,7-dichloro-3-hydroxy-thionaphthene. 4,456,762, Cl. 549-56.000.

Spiro Research B.V.: *See*—
Roffelsen, Franciscus, 4,456,172, Cl. 237-66.000.

Spitaler, Engelbert: *See*—
Nitschko, Theodor; and Spitaler, Engelbert, 4,456,281, Cl. 280-628.000.

Spitza, Dieter, to International Standard Electric Corporation. Facility for fail-safe data transmission between trackside equipment of a guideway and vehicles moving therealong. 4,456,997, Cl. 371-68.000.

Spivack, John D.; and Pastor, Stephen D., to Ciba-Geigy Corporation. 4-(Hydroxyphenylthio)imide stabilizers. 4,456,716, Cl. 524-104.000.

Spurrier, Mack W.: *See*—
Clifford, Graham F.; and Spurrier, Mack W., 4,455,931, Cl. 100-37.000.

Square D Company: *See*—
Harris, Geoffrey J., 4,456,834, Cl. 307-91.000.

SRI International: *See*—
Dawson, Marcia I.; and Chan, Rebecca L. S., 4,456,618, Cl. 424-308.000.
Yarborough, John M., Jr., 4,456,884, Cl. 329-50.000.

Srostlik, Peter: *See*—
Botzem, Werner; Laug, Reiner; Kroll, Hartmut; Schlich, Elmar; Anspach, Walter; Brendel, Karl; and Srostlik, Peter, 4,456,827, Cl. 250-506.100.

Staal, John V.: *See*—
Hella, Richard A.; and Staal, John V., 4,456,811, Cl. 219-121.0LM.

Stabenow, Joachim: *See*—
Maroni, Laszlo; Stabenow, Joachim; and Schwarzmann, Matthias, 4,456,582, Cl. 423-277.000.

Stadler, Hans; Bauer, Lothar; and Strusch, Wolfgang, to Klockner-Humboldt-Deutz Aktiengesellschaft. Cylinder head for a water-cooled internal combustion engine. 4,455,973, Cl. 123-41.760.

Staeger, Hanspeter, to Radiall Industrie. Interior conductor support for high frequency and microwave coaxial lines. 4,456,324, Cl. 339-177.00R.

Stahly, Frederick A., to Limbic Training Systems, Inc. Method and apparatus for facilitating relaxation. 4,456,347, Cl. 351-158.000.

Standard Oil Company: *See*—
Blaskie, M. W.; Fox, J. R.; and Pesa, F. A., 4,456,694, Cl. 502-74.000.

Standard Oil Company (Indiana): *See*—
Hensley, Albert L., Jr.; and Quick, Leonard M., 4,456,699, Cl. 502-208.000.
Lewis, David; Kalina, Davida W.; and Tsai, Tsung-Ein, 4,456,548, Cl. 252-500.000.

Stanis, William J.: *See*—
Silvy, Dorrel R.; and Stanis, William J., 4,456,981, Cl. 365-234.000.

Stanton, George E., to Nujack Oil Pump Corporation. Method for pumping a liquid from a well and apparatus for use therein. 4,456,060, Cl. 166-68.500.

Stapp, Paul R., to Phillips Petroleum Company. Recovery of petroleum sulfonate salt. 4,456,564, Cl. 260-504.00S.

Stark, Suad. Antigen for PCB, antibody raised by same, and method of making same. 4,456,691, Cl. 436-543.000.

Stauffer Chemical Company: *See*—
Groenwold, Bareld E., 4,456,472, Cl. 71-118.000.
Honig, Milton L.; and Weil, Edward D., 4,456,566, Cl. 260-984.000.
Rodson, Marius; and Scher, Herbert B., 4,456,569, Cl. 264-4.700.

Steckler, Steven A.: *See*—
Balaban, Alvin R.; and Steckler, Steven A., 4,456,922, Cl. 358-31.000.

Steelcase, Inc.: *See*—
Raftery, William B., 4,456,212, Cl. 248-558.000.

Steen, Michael J.; and Zell, Michael N., to International Business Machines Corporation. Cantilevered transducer carriage. 4,456,936, Cl. 360-104.000.

Steer, David C.: *See*—
Cox, Roger B.; and Steer, David C., 4,456,714, Cl. 524-56.000.

Steffler, Jean C.; Kaufman, Herman; Porlier, Joseph A. G.; and Firth, James A., to Canada, Her Majesty the Queen in right of, as represented by the Minister of National Defence. Partial pressure jerkin. 4,455,685, Cl. 2-2.10A.

Stehr, Thomas; Brodzina, Lieselotte; and Graf, Richard, to Bosch-Siemens Hausgerate GmbH. Method of varying a manually adjustable program course of an automatically operating washing machine. 4,455,701, Cl. 8-158.000.

Steigerwald, Robert L., to General Electric Company. High gain latching Darlington transistor. 4,456,o39, Cl. 307-315.000.

Stein, Barry F.; and Young, Peter L., to Sperry Corporation. Superconducting circuit fabrication. 4,456,506, Cl. 204-15.000.

Steinberger, Helmut: *See*—
Schonfelder, Manfred; Steinberger, Helmut; and Schmid, Helmut, 4,456,647, Cl. 428-216.000.

Steinkuhl, Bernd: *See*—
Merten, Gerhard; Breuer, Oswald; Hesse, Norbert; and Steinkuhl, Bernd, 4,456,307, Cl. 299-93.000.

Steinmetz, Georg, to Tefo AG. Profile system for assembling a plurality of different pieces of furniture. 4,456,299, Cl. 297-440.000.

Stevenson, David W.: *See*—
Mason, Daniel W.; and Stevenson, David W., 4,456,828, Cl. 250-551.000.

Stewart, Murray F.: *See*—
Van Heteren, Jan; Poot, Cornelis; Reckweg, Freek; and Stewart, Murray F., 4,456,627, Cl. 426-603.000.

Stich, Frederick A., to Siemens-Allis, Inc. Power supply for electronic control system. 4,456,871, Cl. 323-217.000.

Stiefel, Werner: *See*—
Schumann, Frank; Richter, Hans-Jurgen; Stiefel, Werner; and Fritzsche, Klaus, 4,456,379, Cl. 356-381.000.

Stocks, David L. Work clamp and tool guide assembly. 4,456,043, Cl. 144-136.00C.

Stohler, Harro: *See*—
Hofheinz, Werner; and Stohler, Harro, 4,456,610, Cl. 424-273.00R.

Stokes, Vijay K., to General Electric Company. Commutator assembly. 4,456,846, Cl. 310-233.000.

Stoller Enterprises, Inc.: *See*—
Stoller, Jerry H., 4,456,463, Cl. 71-29.000.

Stoller, Jerry H., to Stoller Enterprises, Inc. Ammonia stabilized high analysis liquid fertilizers. 4,456,463, Cl. 71-29.000.

Storage Technology Corporation: *See*—
Ariniello, Robert M., 4,456,200, Cl. 242-185.000.

Stowers, Clifford: *See*—
Foster, Peter D.; and Stowers, Clifford, 4,456,164, Cl. 229-43.000.

Straslicka, William A., to Elliott Turbomachinery Company, Inc. Fluid admission valve structure. 4,456,032, Cl. 137-630.190.

Straw, David A.: *See*—
Morroll, Terence D.; and Straw, David A., 4,456,908, Cl. 340-644.000.

Stringham, Robert R.: *See*—
Bieler, Barrie H.; Morgan, David C.; and Stringham, Robert R., 4,456,512, Cl. 204-162.00R.

Stromer, Carl-Axel; Troealien, Erling; and Lindberg, Jorgen F., to Telefonaktiebolaget LM Ericsson. Fastening arrangement for a handset case halves. 4,456,794, Cl. 179-103.000.

Strusch, Wolfgang: *See*—
Stadler, Hans; Bauer, Lothar; and Strusch, Wolfgang, 4,455,973, Cl. 123-41.760.

Stumpmeier, Fritz. Traction device. 4,456,226, Cl. 254-264.000.

Sturz, Arthur C. Drafting tool for parallel lines. 4,455,750, Cl. 33-43.000.

Su, Wen-Kuang. Folding barbecue. 4,455,991, Cl. 126-9.00R.

Sudbeck, Rainer; Baumgartner, Hans; and Schmitz, Eckehard, to Pierburg GmbH & Co. KG. Method of and an arrangement for controlling return quantities of exhaust. 4,455,987, Cl. 123-569.000.

Sudo, Ryoichi; Miwa, Hiroaki; and Watanabe, Takeshi, to Hitachi, Ltd. Substrate for optical disc recording media. 4,456,659, Cl. 428-447.000.

Sueddeutsche Kuehlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
Hesse, Wolfgang, 4,455,728, Cl. 29-157.30R.

Suetterlin, Norbert: *See*—
Siol, Werner; Fink, Herbert; Klesse, Wolfgang; Rauch, Hubert; and Suetterlin, Norbert, 4,456,726, Cl. 524-501.000.

Sueyoshi, Toshinobu: *See*—
Hirai, Shigeo; Sueyoshi, Toshinobu; and Amemiya, Masahiro, 4,456,475, Cl. 75-0.5AA.

Sugihara, Taisuke: *See*—
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; and Sugihara, Taisuke, 4,456,757, Cl. 546-139.000.

Sugimoto, Yasuo; Maeda, Masami; Ishimura, Hiroshi; Saito, Satoshi; and Chinone, Koichi, to Hitachi Cable Ltd. Apparatus for manufacturing flat twisted cable. 4,455,818, Cl. 57-293.000.

Sugino, Takashi; Itoh, Kunio; Wada, Masaru; and Shimizu, Hirokazu, to Matsushita Electric Industrial Co., Ltd. Terrace-shaped substrate semiconductor laser. 4,456,999, Cl. 372-45.000.

Sugita, Yutaka: *See*—
Suzuki, Ryo; Kodama, Naoki; Ikeda, Tadashi; and Sugita, Yutaka, 4,456,975, Cl. 365-36.000.

Sullivan, Richard F.: *See*—
Lyman, Joseph A., 4,455,970, Cl. 122-20.00B.

Sulzer Brothers Limited: *See*—
Melcer, Henryk, 4,456,057, Cl. 165-95.000.

Sumitomo Chemical Company, Limited: *See*—
Tamura, Mitsuhisa; and Sato, Hiroshi, 4,456,562, Cl. 260-465.00F.

Sumitomo Metal Industries, Inc.: *See*—
Masuda, Seiichi; Matsuo, Tohru; Ohkita, Yoshimichi; Aoki, Takeo; Nakajima, Hidemasa; Okamura, Shozo; Hirata, Takeyuki; and Anezaki, Shoji, 4,456,477, Cl. 75-51.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Arimatsu, Toshio, 4,456,806, Cl. 219-10.55M.

Sun Tech, Inc.: *See*—
Recchuite, Alexander D., 4,456,540, Cl. 252-48.600.

Suncor, Inc.: *See*—
Seitzer, Walter H., 4,456,533, Cl. 210-708.000.

Sunds Defibrator AB: *See*—
Bystedt, Hjalmar S. I., 4,456,503, Cl. 162-261.000.

Sunouchi, Akio; Fujino, Masahisa; and Suzuki, Ryuji, to Canon Kabushiki Kaisha. Release operation device for camera. 4,456,357, Cl. 354-266.000.

Super-Tek Products, Inc.: *See*—
Garuti, John, Sr.; Garuti, John, Jr.; and Merkel, Karl, 4,456,728, Cl. 524-522.000.

Susman, Leon: *See*—
Rao, B. Rama; and Susman, Leon, 4,456,913, Cl. 343-361.000.

Suter, Charles A.; and Namsick, Raymond J., to Goodyear Aerospace Corporation. Method of making an elastomeric fabric container. 4,456,496, Cl. 156-249.000.

Sutherland, Donald M., to Ford Motor Company. Anti-rattle pushbutton assembly. 4,456,802, Cl. 200-340.000.

Suttinger, Richard; Bottger, Ernst; Henrich, Hans O.; Bahr, Theodor; and Thumm, Helmut, to J. M. Voith GmbH. Pulp grinder with liquid retention. 4,456,182, Cl. 241-46.020.

Sutton, Bailous C. Clamp apparatus. 4,455,720, Cl. 24-20.00S.

Suzuki, Atsushi; Kawashima, Yutaka; and Ninomiya, Masakazu, to Nippondenso Co., Ltd. Method and system for control of air-fuel ratio. 4,455,981, Cl. 123-438.000.

Suzuki, Haruhide. Apparatus for supporting the mast of a sailing board. 4,455,959, Cl. 114-90.000.

Suzuki, Kouichi: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,456,558, Cl. 260-413.000.

Suzuki, Nobuo: *See*—
Onogi, Tsuyoshi; Ueoka, Tetsuya; Suzuki, Nobuo; Oohara, Yoshihito; and Osozuka, Toshiaki, 4,457,017, Cl. 382-65.000.

Suzuki, Ryo; Kodama, Naoki; Ikeda, Tadashi; and Sugita, Yutaka, to Hitachi, Ltd. Magnetic bubble memory device with guardrail. 4,456,975, Cl. 365-36.000.

Suzuki, Ryuji: *See*—
Sunouchi, Akio; Fujino, Masahisa; and Suzuki, Ryuji, 4,456,357, Cl. 354-266.000.

Suzuki, Takeshi: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,456,558, Cl. 260-413.000.

Suzuki, Yoshihisa; and Seiki, Kazuo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and apparatus for fasciated yarn spinning. 4,455,819, Cl. 57-404.000.

Swayze, Kenneth, to Dennison Manufacturing Company. Apparatus for handling oval articles. 4,456,422, Cl. 414-744.00A.

Svensson, Malte, to Airail Systems, Inc. Air bearing power and traction drive system. 4,455,945, Cl. 104-23.0FS.

Swift, Edward R., Jr.; and Echols, John B., to Baker International Corporation. Filters used in well fluid cleaning operations. 4,456,061, Cl. 166-75.00R.

Swiss-Tex Incorporated: *See*—
Graham, John W., 4,455,705, Cl. 15-121.000.

Swittes, Jan M. B., to Du Pont de Nemours, E. I., and Company. Can manufacture. 4,455,850, Cl. 72-46.000.

SXD Refractories: *See*—
Frey, David J.; and Wier, Keith E., 4,456,574, Cl. 264-71.000.

Sybron Corporation: *See*—
Pietschmann, Helmut; and Lipp, Herbert, 4,456,297, Cl. 297-316.000.

Syntex (U.S.A.) Inc.: *See*—
Muchowski, Joseph M.; and Greenhouse, Robert, 4,456,759, Cl. 548-453.000.

Szabo, Lajos: *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo , 4,456,607, Cl. 424-262.000.

Szabo, Steve, Jr.; and Yaney, Noel A., to Word Corporation. System for separately receiving multiple station audio-tour signals. 4,457,019, Cl. 455-41.000.

Szabo, William. Weight lifting exercising apparatus. 4,456,246, Cl. 272-118.000.

Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo , to Richter Gedeon Vegyeszeti Gyar Rt. 9-Bromo-hexahydro- and octahydro-indolo[2,3 a]quinolizines and use for increasing blood circulation. 4,456,607, Cl. 424-262.000.

Szczepanski, Francis A., to LaSalle Machine Tool, Inc. Conveyor with slow down section. 4,456,117, Cl. 198-461.000.

Szporny, Laszlo : *See*—
Szantay, Csaba; Szabo, Lajos; Kalaus, Gyorgy; Dancsi, Lajos; Keve, Tibor; Karpati, Egon; and Szporny, Laszlo , 4,456,607, Cl. 424-262.000.
Toth, Jozsef; Hajos, Gyorgy; Fekete, Gyorgy; Horvath, Istvan; Szporny, Laszlo ; Boor nee Mezei, Anna; Aranyi, Peter; Naray, Aniko; Gorog, Sandor; Holly, Sandor; and Molnar, Csaba, 4,456,601, Cl. 424-241.000.

Szulczyk, Andreas: *See*—
Malikowski, Willi; Szulczyk, Andreas; Bohm, Wolfgang; and Wolmer, Roger, 4,456,662, Cl. 428-632.000.

Szymanski, Michael J.; Weber, Harold J.; Kuehnle, Manfred R.; and Fraser, Kenneth D., to Coulter Systems Corporation. Toning system for electrostatic imaging apparatus. 4,456,367, Cl. 355-10.000.

Tachibana, Kouji, to Mitsubishi Denki Kabushiki Kaisha. Device for cooling salient-type rotor by ventilation. 4,456,842, Cl. 310-61.000.

Taeymans, Jean R. J. M.: *See*—
Chea, Ramon C. W., Jr.; Das, Santanu; Upp, Daniel C.; Cornu, Jozef; Danneels, Johan M. R.; and Taeymans, Jean R. J. M., 4,456,991, Cl. 370-58.000.

Tagaki, Shinji, to Kabushiki Kaisha Kawai Gakki Seisakusho. Keyboard musical instrument. 4,455,912, Cl. 84-177.000.

Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, to Tokyo Shibaura Denki Kabushiki Kaisha. Level shifting circuit. 4,456,838, Cl. 307-264.000.

Taifu, Tatsuya; and Oonaka, Hidemi, to Toyota Jidosha Kabushiki Kaisha. Carburetor choke valve opening device. 4,456,568, Cl. 261-39.00A.

Takada, Juichiro. Emergency locking vehicle safety belt retractor. 4,456,195, Cl. 242-107.40B.

Takada, Juichiro; Ueno, Shuichi; and Isamu, Kazuo, to Nissan Motor Co., Ltd.; and Takata Kojyo Co., Ltd. Seat belt retractor with a tension eliminator. 4,456,196, Cl. 242-107.600.

Takagi, Kiyotaka: *See*—
Kondo, Takashi; Takagi, Kiyotaka; and Nishiyama, Taichiro, 4,456,380, Cl. 356-418.000.

Takahara, Kazuhiro; Kurahashi, Keizo; and Yamaguchi, Hisashi, to Fujitsu Limited. Method and circuit for selectively driving capacitive display cells in a matrix type display. 4,456,909, Cl. 340-781.000.

Takahara, Yoshimasa: *See*—
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Isaka, Kazuo; Hosono, Nagao; and Takahashi, Tohru, 4,456,368, Cl. 355-3.0FU.

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Nakagome, Yukio; Ogawa, Akira; Hirata, Yasuo; and Takahashi, Toshio, 4,456,988, Cl. 370-75.000.

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Nishioka, Akira; Kawanabe, Yoshihiro; Fujimoto, Hideki; and Takahori, Hiroyuki, 4,456,886, Cl. 330-254.000.

Takashima, Yuji: *See*—
Yubakami, Keiichi; Takashima, Yuji; and Shimotsuma, Wataru, 4,456,669, Cl. 430-45.000.

Takasu, Yoshio: *See*—
Mabuchi, Minoru; Fujimura, Naoto; Ishikawa, Shozo; Takasu, Yoshio; Sakai, Kiyoshi; and Kuribayashi, Masaki, 4,456,671, Cl. 430-58.000.

Takata Kojyo Co., Ltd.: *See*—
Takada, Juichiro; Ueno, Shuichi; and Isamu, Kazuo, 4,456,196, Cl. 242-107.600.

Takayama, Ryoichi; Tokushima, Akira; Ueshiba, Nozomu; and Ise, Yukihiko, to Matsushita Electric Industrial Co., Ltd. Piezoelectric ultrasonic transducer with damped suspension. 4,456,849, Cl. 310-324.000.

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Kamatani, Yoshio; Tanaka, Michio; Yamazaki, Kyuya; and Nishino, Kenichi, 4,456,744, Cl. 528-71.000.

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Takenoya, Hideaki; Inamori, Mikio; and Shomura, Eiichi, to Janome Sewing Machine Co., Ltd. Stitch control method for an electronic sewing machine. 4,455,953, Cl. 112-262.100.

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Takeuchi, Kiyoshi, to Nissan Motor Company, Limited. Method and apparatus of detecting engine knocking. 4,455,862, Cl. 73-35.000.

Takeuchi, Yasuhisa: *See*—
Kishi, Norimasa; Sasanuma, Kiyoshi; Takeuchi, Yasuhisa; and Kato, Shinichi, 4,456,903, Cl. 340-54.000.

Takigawa, Tomoshi: *See*—
Hirata, Noritsugu; Okajima, Hidekazu; Takigawa, Tomoshi; Ichiyanagi, Toshikazu; and Takimoto, Hiroyuki, 4,456,349, Cl. 352-91.00C.

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Talbert Manufacting, Inc.: *See*—
Gevers, David E., 4,456,280, Cl. 280-444.000.

Tamm, Paul W.: *See*—
Spars, Byron G.; Tamm, Paul W.; and Wallman, P. Henrik, 4,456,504, Cl. 201-12.000.

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Taniguchi, Shozo; Shinke, Osamu; Ishii, Masami; and Kubo, Shinichi, to Fujitsu Limited. Data processing system with error processing apparatus and error processing method. 4,456,993, Cl. 371-10.000.
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Yamada, Takeshi; Ohashi, Hideki; and Tanimoto, Masahiro, 4,456,580, Cl. 422-63.000.
Tannenbaum, Alan R.: *See*—
Carlgren, Richard G.; Rosenbaum, Walter S.; and Tannenbaum, Alan R., 4,456,973, Cl. 364-900.000.
Tanoi, Tadao: *See*—
Mikiya, Toshio; Shoji, Mitihiro; and Tanoi, Tadao, 4,456,410, Cl. 408-76.000.
Taplin, Lael B., to Vickers, Incorporated. Electro-hydraulic servo valve system. 4,456,031, Cl. 137-625.620.
Tasch, Al F., Jr.: *See*—
Houston, Theodore W.; Tasch, Al F., Jr.; Darley, Henry M.; and Fu, Horng S., 4,455,738, Cl. 29-571.000.
TDK Electronics Co., Ltd.: *See*—
Sato, Takateru; and Shiba, Haruo, 4,456,192, Cl. 242-74.100.
Toyoshima, Yohtaro; Sasaki, Yasuhiro; and Uchida, Minoru, 4,456,900, Cl. 336-221.000.
Technicare Corporation: *See*—
Compton, Russell A., 4,456,881, Cl. 324-319.000.
Technion Research and Development Foundation, Ltd.: *See*—
Cais, Michael; and Shimoni, Moshe, 4,456,690, Cl. 436-500.000.
Techsight Corporation: *See*—
Weber, Hermann, 4,455,964, Cl. 118-500.000.
Tecumseh Products Company: *See*—
Kuczenski, Steven R., 4,455,977, Cl. 123-198.0DC.
Tefo AG: *See*—
Steinmetz, Georg, 4,456,299, Cl. 297-440.000.
Teijin Limited: *See*—
Oshida, Jun-ichi; Nishikawa, Osamu; Tsuruta, Hideki; Takeshita, Toru; Yamamoto, Itaru; and Ishimaru, Kenji, 4,456,553, Cl. 260-397.200.
Tektronix, Inc.: *See*—
Robinder, Ronald C.; Bates, David J.; and Denham, Dan F., 4,456,853, Cl. 313-421.000.
Telecommunications Radioelectriques et Telephoniques T.R.T.: *See*—
Forestier, Alain, 4,456,791, Cl. 179-18.0FA.
Teledyne Industries, Inc.: *See*—
McGinniss, Robert L., 4,456,481, Cl. 75-82.000.
Telefonaktiebolaget L M Ericsson: *See*—
Hammerberg, Lars E.; Hjortendal, Royne G.; and Ghisler, Walter, 4,456,940, Cl. 361-56.000.
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Stromer, Carl-Axel; Tronslien, Erling; and Lindberg, Jorgen F., 4,456,794, Cl. 179-103.000.
Temple, Davis L., Jr.; and Yeager, Richard E., to Mead Johnson & Company. Spirothiazolidinyl piperazine derivatives. 4,456,756, Cl. 544-364.000.
Templin, Frank C.: *See*—
Skerlos, Peter C.; Zato, Thomas J.; and Templin, Frank C., 4,456,925, Cl. 358-85.000.
Tennenhouse, Gerald J.: *See*—
Crosbie, Gary M.; Tennenhouse, Gerald J.; Tischer, Ragnar P.; and Wroblowa, Halina S., 4,456,631, Cl. 429-104.000.
Crosbie, Gary M.; Tennenhouse, Gerald J.; Tischer, Ragnar P.; and Wroblowa, Halina S., 4,456,664, Cl. 429-104.000.
Terada, Hiroshi: *See*—
Akimoto, Hidetoshi; Kaji, Ryuichi; Komuro, Takeo; Muranaka, Yasushi; Kikuchi, Hideo; Hishinuma, Yukio; Nakajima, Fumito; and Terada, Hiroshi, 4,456,528, Cl. 209-49.000.
Terakura, Yukio: *See*—
Kuramochi, Koujiro; Watanabe, Kazuaki; and Terakura, Yukio, 4,455,890, Cl. 74-783.000.
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Kubota, Misao; Terao, Kazuhiko; and Shimada, Kenji, 4,456,531, Cl. 210-409.000.
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Terumo Corporation. *See*—
Hirano, Toshinori; and Murase, Masakazu, 4,456,959, Cl. 364-417.000.
Texaco Inc.: *See*—
Jenkins, Robert H., Jr., 4,456,454, Cl. 44-73.000.
Texas Instruments Incorporated: *See*—
Graber, Warren S.; and Someshwar, Ashok H., 4,456,965, Cl. 364-900.000.
Houston, Theodore W.; Tasch, Al F., Jr.; Darley, Henry M.; and Fu, Horng S., 4,455,738, Cl. 29-571.000.
Hynecek, Jaroslav, 4,455,739, Cl. 29-571.000.
Paros, Jerome M., 4,455,874, Cl. 73-704.000.
Price, Robert B.; and Jones, David L., 4,456,961, Cl. 364-513.000.
Th. Goldschmidt AG: *See*—
Fock, Jurgen, 4,456,773, Cl. 568-608.000.
Tharp, Edwin B.: *See*—
Hartnett, Michael J.; Robinson, Chris J.; and Tharp, Edwin B., 4,456,313, Cl. 308-202.000.
Therm-O-Disc, Incorporated: *See*—
Schmitt, Donald J., 4,455,886, Cl. 74-531.000.
Thibault, Alphee. Picking implement. 4,456,113, Cl. 193-7.000.
Thiemann, Donald J.: *See*—
McCarty, William V.; and Thiemann, Donald J., 4,456,425, Cl. 415-122.00R.
Thiokol Corporation: *See*—
Barnes, Michael W.; Kristofferson, Clifford E.; and Manzara, Anthony P., 4,456,493, Cl. 149-19.400.
Thirion, Christian: *See*—
Morin, Pierre; and Thirion, Christian, 4,455,952, Cl. 112-121.120.
Thomas, Alford M.: *See*—
Herrin, Thomas R.; and Thomas, Alford M., 4,456,593, Cl. 424-177.000.
Thomas, John E.: *See*—
Tippins, George W.; Thomas, John E.; Connolly, Richard S.; Pine, Charles K.; and Pottmeyer, Wayne G., 4,455,848, Cl. 72-12.000.
Thomas, Mammen: *See*—
Bayman, Atiye; and Thomas, Mammen, 4,456,501, Cl. 156-643.000.
Thomas, Paul E.; and Raley, Garland E., to Ethyl Corporation. Treatment of perforated film. 4,456,570, Cl. 264-22.000.
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Thomson-Brandt: *See*—
Guillon, Jean C.; Coschieri, Jean C.; Duret, Bernard; and Van den Driessche, Michel, 4,456,928, Cl. 358-181.000.
Thomson-CSF: *See*—
Henry, Raymond; Simon, Jacques; Levy, Daniele; Carpenter, Jean-Francois; and Defaut, Bernard, 4,456,334, Cl. 350-320.000.
Huignard, Jean P.; and Malard, Marcel, 4,456,327, Cl. 350-3.600.
Tournois, Pierre, 4,456,982, Cl. 367-11.000.
Thomson-CSF Broadcast, Inc.: *See*—
Kruger, Robert A.; Baron, Stanley N.; and Liu, Ping Y., 4,456,926, Cl. 358-111.000.
Thomson Industries, Inc.: *See*—
Rogers, Alfred M., III; and Carter, Frank E., 4,456,312, Cl. 308-6.00C.
Thoratec Laboratories Corporation: *See*—
Buck, Keith E.; Chase, Irving C.; and Morin, Marius J., 4,456,014, Cl. 128-719.000.
Thorn Emi Energy Developments, Limited: *See*—
Northcote, Reginald D., 4,455,968, Cl. 122-4.00D.
Thorsrud, Agmund K.: *See*—
Siedenstrang, Roy W.; and Thorsrud, Agmund K., 4,456,706, Cl. 521-89.000.
Thumm, Helmut: *See*—
Suttinger, Richard; Bottger, Ernst; Henrich, Hans O.; Bahr, Theodor; and Thumm, Helmut, 4,456,182, Cl. 241-46.020.
Tiboldi, Janos, to Vilati Villamos Automatika Fovallalkozo es Gyarto Vallalat. Solar wheel. 4,455,833, Cl. 60-641.150.
Tijssen, Hartmut, to Messerschmitt-Bolkow-Blohm Gesellschaft m.b.H. Fastening devices for attaching of built-in elements. 4,456,206, Cl. 244-118.500.
Tippins, George W.; Thomas, John E.; Connolly, Richard S.; Pine, Charles K.; and Pottmeyer, Wayne G., to Tippins Machinery Company, Inc. Apparatus for underwinding strip on a drum in a hot reversing mill. 4,455,848, Cl. 72-12.000.
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Tippins, George W.; Thomas, John E.; Connolly, Richard S.; Pine, Charles K.; and Pottmeyer, Wayne G., 4,455,848, Cl. 72-12.000.
Tippit, Larry J.: *See*—
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Tischer, Ragnar P.: *See*—
Crosbie, Gary M.; Tennenhouse, Gerald J.; Tischer, Ragnar P.; and Wroblowa, Halina S., 4,456,631, Cl. 429-104.000.
Crosbie, Gary M.; Tennenhouse, Gerald J.; Tischer, Ragnar P.; and Wroblowa, Halina S., 4,456,664, Cl. 429-104.000.
TMC Corporation: *See*—
Nitschke, Theodor; and Spitaler, Engelbert, 4,456,281, Cl. 280-628.000.
Tobias, Robert W.: *See*—
Murray, John; and Tobias, Robert W., 4,455,942, Cl. 102-444.000.
Tochikubo, Osamu: *See*—
Torii, Yoshihiko; and Tochikubo, Osamu, 4,455,882, Cl. 73-864.650.
Toeppen, Thurston H., to AMP Incorporated. Method and apparatus for trimming shielded cable. 4,455,745, Cl. 30-90.600.
Tokuda, Hiroyuki: *See*—
Masaki, Nobuo; Tokuda, Hiroyuki; Furukawa, Yoshiki; Sakurai, Mitsuru; and Nitanda, Hiroshi, 4,456,362, Cl. 355-3.00R.
Tokumo, Akio, to Pioneer Electronic Corporation. Differential amplifier. 4,456,887, Cl. 330-261.000.
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Tokyo Juki Industrial Co., Ltd.: *See*—
Barozzi, Gian P.; and Horeschi, Giancarlo, 4,456,395, Cl. 400-559.100.
Tokyo Kogaku Kikai Kabushiki Kaisha: *See*—
Iwafune, Yasuo; and Kobayashi, Yuji, 4,455,758, Cl. 33-282.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Gamoh, Ryouji, 4,456,878, Cl. 324-142.000.
Hattori, Motoichi, 4,456,385, Cl. 368-187.000.
Iesaka, Susumu, 4,456,920, Cl. 357-46.000.
Iwai, Hiroshi, 4,455,740, Cl. 29-571.000.

Mohrman, Edward A.; Umeno, Tsunetaka; and Sato, Fumitaka, 4,456,952, Cl. 364-200.000.
Osada, Kimio; Hayashi, Motokazu; and Kanei, Taketo, 4,456,854, Cl. 315-58.000.
Taguchi, Shinichiro; Nagao, Nobuya; and Ogihara, Yutaka, 4,456,838, Cl. 307-264.000.
Tomcavage, Joseph R., to RCA Corporation. Electron tube having a low impedance reduced stress anode structure. 4,456,851, Cl. 313-250.000.
Tominaga, Hiroshi, to Fuji Electric Co., Ltd. Automatic vending machine. 4,456,147, Cl. 221-67.000.
Tomita, Katsuhiko; Shimizu, Tetsuo; and Bandoh, Masaichi, to Horiba, Ltd. Thermopile type detector with temperature sensor for cold junction. 4,456,919, Cl. 357-28.00A.
Tomita, Masao: *See*—
Honjo, Masahiro; and Tomita, Masao, 4,456,932, Cl. 360-36.100.
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Toops, Richard A.: *See*—
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Toray Industries, Inc.: *See*—
Yamamoto, Yoshiyuki; Inoue, Toshihide; and Yanagi, Masana, 4,456,719, Cl. 524-114.000.
Torday & Carlisle PLC: *See*—
Torday, John; and Bush, Michael E., 4,456,508, Cl. 204-27.000.
Torday, John; and Bush, Michael E., to Torday & Carlisle PLC. Treatment of copper foil. 4,456,508, Cl. 204-27.000.
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Torres, Israel. Automotive trunk table. 4,455,948, Cl. 108-44.000.
Torrington Company, The: *See*—
Hartnett, Michael J.; Robinson, Chris J.; and Tharp, Edwin B., 4,456,313, Cl. 308-202.000.
Toth, Jozsef; Hajos, Gyorgy; Fekete, Gyorgy; Horvath, Istvan; Szporny, Laszlo ; Boor nee Mezei, Anna; Aranyi, Peter; Naray, Aniko; Gorog, Sandor; Holly, Sandor; and Molnar, Csaba, to Richter Gedeon Vegyeszeti Gyar Rt. 3-Chloro-pregnane derivatives and a process for the preparation thereof. 4,456,601, Cl. 424-241.000.
Totoku Electric Co., Ltd.: *See*—
Kubota, Misao; Terao, Kazuhiko; and Shimada, Kenji, 4,456,531, Cl. 210-409.000.
Tournois, Pierre, to Thomson-CSF. Imaging system with multiple, simultaneous transmissions. 4,456,982, Cl. 367-11.000.
Townsend Engineering Company: *See*—
Townsend, Ray T., 4,455,928, Cl. 99-533.000.
Townsend, Glenda P.: *See*—
Messelt, Christopher D.; and Townsend, Glenda P., 4,456,751, Cl. 536-91.000.
Townsend, Ray T., to Townsend Engineering Company. Means for injecting fluids into food products. 4,455,928, Cl. 99-533.000.
Toyama Machine Works, Ltd.: *See*—
Junichi, Kita; and Nagahara, Toshio, 4,455,838, Cl. 60-711.000.
Toyo Denki Kogyosho Co., Ltd.: *See*—
Araoka, Toshinobu, 4,456,424, Cl. 415-121.00G.
Toyoda, Kenji; Watanabe, Takao; Inoue, Hideya; Kasuya, Atsumi; Ichihara, Yutaka; Miyaji, Akira; and Mizunoe, Katsumi, to Nippon Kogaku K.K. Electronic camera. 4,456,931, Cl. 358-335.000.
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Toyota Jidosha Kabushiki Kaisha: *See*—
Taifu, Tatsuya; and Oonaka, Hidemi, 4,456,568, Cl. 261-39.00A.
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Ito, Hiroshi; and Kusumoto, Sinsuke, 4,456,107, Cl. 192-3.310.
Kuramochi, Koujiro; Watanabe, Kazuaki; and Terakura, Yukio, 4,455,890, Cl. 74-783.000.
Yoshimi, Akiro; Kamiya, Michihiko; Kojima, Yasuhumi; Ootsuka, Fumio; and Matsushima, Takeo, 4,456,055, Cl. 165-12.000.
Transformatoren Union AG: *See*—
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Botzem, Werner; Laug, Reiner; Kroll, Hartmut; Schlich, Elmar; Anspach, Walter; Brendel, Karl; and Srostlik, Peter, 4,456,827, Cl. 250-506.100.
Traub, Stefan; and Rochlitzer, Frank, to Hewlett-Packard GmbH. Regulated power supply. 4,456,833, Cl. 307-80.000.
Travers, Christine; Trinh Dinh, Chan; Snappe, Roger; and Bournonville, Jean-Paul, to Institut Francais du Petrole. Catalytic process for manufacturing alcohols by hydrogenolysis of carboxylic acid esters. 4,456,775, Cl. 568-885.000.
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Travers, Christine; Trinh Dinh, Chan; Snappe, Roger; and Bournonville, Jean-Paul, 4,456,775, Cl. 568-885.000.
Tronslien, Erling: *See*—
Stromer, Carl-Axel; Tronslien, Erling; and Lindberg, Jorgen F., 4,456,794, Cl. 179-103.000.
Trott, Graham J.: *See*—
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Trotter, Ralph R.: *See*—
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Trut'k Research, Inc.: *See*—
Nowacki, Christopher; and Brisson, Alfred S., 4,456,016, Cl. 128-725.000.
TRW Canada Limited: *See*—
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Tsai, Tsung-Ein: *See*—
Lewis, David; Kalina, Davida W.; and Tsai, Tsung-Ein, 4,456,548, Cl. 252-500.000.
Tsakiris, Nicholas G., to Wasco Products, Inc. Skylight system. 4,455,798, Cl. 52-200.000.
Tschirner, Wolfgang, to Kleinewefers, Jaeggli Textilmaschinen AG. Friction-driven roll for treating web-like intermediate products by compression. 4,455,727, Cl. 29-113.00R.
Tsuda, Yuji: *See*—
Ogino, Yoshio; Kobayashi, Takao; Tsuda, Yuji; and Nishimura, Hitoshi, 4,456,807, Cl. 219-10.770.
Tsuji, Naoki: *See*—
Tanaka, Kentaro; Kondo, Eiji; Matsumoto, Kouichi; Shoji, Jun'ichi; and Tsuji, Naoki, 4,456,686, Cl. 435-119.000.
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Oshida, Jun-ichi; Nishikawa, Osamu; Tsuruta, Hideki; Takeshita, Toru; Yamamoto, Itaru; and Ishimaru, Kenji, 4,456,553, Cl. 260-397.200.
Tsuruta, Kiyofumi; Osanai, Yoshimi; and Onda, Takanori, to Honda Giken Kogyo Kabushiki Kaisha. Change speed transmission for motorcycles. 4,455,884, Cl. 74-477.000.
Tuji, Yoshimasa: *See*—
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Tultex Corp.: *See*—
Franck, William F., III; and Cooke, Bobby J., 4,455,954, Cl. 112-262.300.
Turnbaugh, Larry L.: *See*—
French, Kenneth W.; Neil, Jeffrey T.; and Turnbaugh, Larry L., 4,456,713, Cl. 523-455.000.
Turner, George F. A. M., to Ciba-Geigy AG. Flat photographic sheet processing cassette. 4,456,359, Cl. 354-312.000.
Turunen, Olli: *See*—
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Tzschoppe, Eberhard: *See*—
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Ubl, Heinz: *See*—
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Uchida, Kuninobu: *See*—
Yoshioka, Teruo; Naito, Shiro; Abe, Yuzo; and Uchida, Kuninobu, 4,455,734, Cl. 29-434.000.
Uchida, Minoru: *See*—
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Uchida, Shigeru; Watanabe, Kazuo; Ozawa, Kousaku; and Kawaharada, Minoru, to Nippon Steel Corporation. Press-rolling process for producing a metal tubular product. 4,455,849, Cl. 72-41.000.
Uchida, Yoshiyuki: *See*—
Nishiura, Masaharu; Sakai, Hiroshi; Miyagi, Masahide; Uchida, Yoshiyuki; and Haruki, Hiromu, 4,456,782, Cl. 136-244.000.
Ueno, Shuichi: *See*—
Takada, Juichiro; Ueno, Shuichi; and Isamu, Kazuo, 4,456,196, Cl. 242-107.600.
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Onogi, Tsuyoshi; Ueoka, Tetsuya; Suzuki, Nobuo; Oohara, Yoshihito; and Onozuka, Toshiaki, 4,457,017, Cl. 382-65.000.
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Takayama, Ryoichi; Tokushima, Akira; Ueshiba, Nozomu; and Ise, Yukihiko, 4,456,849, Cl. 310-324.000.
Uhde GmbH: *See*—
Korner, Jorg P., 4,456,440, Cl. 417-540.000.
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Mohrman, Edward A.; Umeno, Tsunetaka; and Sato, Fumitaka, 4,456,952, Cl. 364-200.000.
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Shibata, Sueji; and Umesato, Shoji, 4,456,318, Cl. 339-17.0CF.
Umetsu, Junji, to Ashai Optical Co., Ltd. Removable coupling device between a photographic camera and an accessory. 4,455,723, Cl. 24-647.000.
Umiker, Hans: *See*—
Manz, Kurt; and Umiker, Hans, 4,455,935, Cl. 101-35.000.
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Krude, Werner; Muller, Karl-Heinz; and Riemscheid, Helmut, 4,456,269, Cl. 277-212.0FB.
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Zuidam, Jan; van Nassau, Petrus J. M.; Bruls, Pierre G. M. B.; and Jonckers, Kees, 4,456,535, Cl. 210-750.000.
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Sherman, John D.; and Chao, Chien C., 4,456,774, Cl. 568-872.000.
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Doweyko, Arthur M. P.; Regis, Richard R.; and Bell, Allyn R., 4,456,470, Cl. 71-94.000.

United Kingdom of Great Britain and Northern Ireland, Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Barton, Norman P., 4,455,918, Cl. 89-41.00L.
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Agriculture: *See—*
Weller, David M.; Cook, R. James; and Wilkinson, Henry T., 4,456,684, Cl. 435-34.000.
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Chin, Te N., 4,456,677, Cl. 430-276.000.
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Arny: *See—*
Furuike, Haruo H., 4,455,940, Cl. 102-228.000.
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McPherson, Malcolm J.; and Bellman, Robert A., 4,455,876, Cl. 73-747.000.
Sommargren, Gary E., 4,456,339, Cl. 350-403.000.
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MacConochie, Ian O.; Lawson, Ashby G.; and Kelly, H. Neale, 4,456,208, Cl. 244-158.00A.
Wydeven, Theodore J.; and Katz, Moshe G., 4,456,708, Cl. 521-141.000.
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DeMarco, Ronald A.; and Moran, Michael J., 4,456,583, Cl. 423-277.000.
Hansen, Charles E.; and Hanson, Paul A., 4,455,961, Cl. 114-254.000.
Kumar, Mahesh, 4,456,889, Cl. 330-279.000.
Price, Donald A., Jr.; and Louis, Charles A., iII, 4,456,202, Cl. 244-3.150.
Whittaker Wolden B., 4,455,916, Cl. 89-1.812.
Wier, John P.; and Garrett, Robert A., 4,456,086, Cl. 180-11.000.
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Annegarn, Marcellinus J. J. C.; and Heijnemans, Werner A. L., 4,456,923, Cl. 358-64.000.
Botden, Peter J. M., 4,457,009, Cl. 378-19.000.
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Segarra, Gerard, 4,456,994, Cl. 371-16.000.
van de Grift, Robert E. J., 4,456,904, Cl. 340-347.0AD.
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United States Steel Corporation: *See—*
Leonard, Ralph W., 4,456,663, Cl. 428-653.000.
United Technologies Corporation: *See—*
Galasso, Francis S.; and Brennan, John J., 4,456,634, Cl. 427-228.000.
Jones, Dennis C.; and Marshall, James F., 4,456,178, Cl. 239-265.390.
Sharon, Harold M., 4,455,787, Cl. 51-241.00S.
University of Chicago, The: *See—*
Fried, Josef, 4,456,768, Cl. 562-503.000.
University of South Carolina: *See—*
Dorty, Francis D., 4,456,882, Cl. 324-321.000.
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Upp, Daniel C.: *See—*
Chea, Ramon C. W., Jr.; Das, Santanu; Upp, Daniel C.; Cornu, Jozef; Danneels, Johan M. R.; and Taeymans, Jean R. J. M., 4,456,991, Cl. 370-58.000.
Urban, Edward J.: *See—*
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Urban, Manfred: *See—*
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Utex Industries, Inc.: *See—*
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Vacco Industries: *See—*
Kay, George; and Keskinen, Alan, 4,456,033, Cl. 138-42.000.
Vaillette, Gary P.: *See—*
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Cadars, Patrick, 4,456,059, Cl. 165-173.000.
Van Aken Redinger, Peter; and Compton, Richard A., to Minnesota Mining and Manufacturing Company. Silicone gel filled prosthesis. 4,455,691, Cl. 3-36.000.
van Baal, Petrus H., to Amcur N.V. Method and apparatus for making tubular containers, at least substantially closed at one end, from pipe material by cold-working. 4,455,725, Cl. 29-1.300.
Vance, Eric J.: *See—*
Nally, Robert B.; Akister, James F.; Leung, Patrick C.; and Vance, Eric J., 4,457,015, Cl. 382-45.000.
van de Grift, Robert E. J., to U.S. Philips Corporation. Analog-to-digital converter circuit. 4,456,904, Cl. 340-347.0AD.
Van den Driessche, Michel: *See—*
Guillon, Jean C.; Coschieri, Jean C.; Duret, Bernard; and Van den Driessche, Michel, 4,456,928, Cl. 358-181.000.
Van der Burgt, Maarten J., to Shell Oil Company. Process and reactor for the preparation of synthesis gas. 4,456,546, Cl. 252-373.000.
Vandergraaf, Johannes J., to General Electric Company. Temperature compensating circuit for use with crystal oscillators and the like. 4,456,892, Cl. 331-176.000.
van der Lely, Ary; and Bom, Cornelis J. G., to C. Van der Lely N.V. Device for transporting and/or spreading liquids. 4,456,039, Cl. 141-98.000.
Van Der Roer, Humphrey, to Fuji Kikai Kogyo Kabushiki Kaisha. Color head for offset press. 4,455,934, Cl. 101-35.000.
van Deursen, Gary E., to General Electric Company. Adjustable hair curler. 4,456,020, Cl. 132-34.00C.
Van Heteren, Jan; Poot, Cornelis; Reckweg, Freek; and Stewart, Murray F., to Lever Brothers Company. Polyglycerol esters. 4,456,627, Cl. 426-603.000.
Vanlerberghe, Guy; Sebag, Henri; and Pierre, Rene, to L'Oreal. Nonionic surface-active agents derived from glucose, process for their preparation and compositions containing them. 4,456,586, Cl. 424-70.000.
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Van Wijk, Keimpe, to U.S. Philips Corporation. Magnetic pick-up and/or cutter cartridge. 4,456,984, Cl. 369-170.000.
Varitork Research Mechanism, Inc.: *See—*
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Vcelka, John L.; Pisik, Jay J.; and Hohberger, Clive P., to Abbott Laboratories. Intravenous pump chamber assembly. 4,456,009, Cl. 604-152.000.
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Schumann, Frank; Richter, Hans-Jurgen; Stiefel, Werner; and Fritzsche, Klaus, 4,456,379, Cl. 356-381.000.
Vecchiarelli, Francis, to Hunter Douglas International N.V. Spring biased tilt rod control system. 4,456,049, Cl. 160-176.00R.
Venturon Corporation, Inc.: *See—*
Sciortino, George J., 4,456,149, Cl. 222-1.000.
Verson Allsteel Press Company: *See—*
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Vesecky, Thompson B.: *See—*
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Vickers, Incorporated: *See—*
El Ibiary, Yehia, 4,456,434, Cl. 417-218.000.
Taplin, Lael B., 4,456,031, Cl. 137-625.620.
Vidicraft, Inc.: *See—*
Marin, Roger A., 4,456,927, Cl. 358-153.000.
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Vignando, Bruno: *See—*
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Vigneri, Ronald J. Process and apparatus for treating hydrocarbon-bearing well formations. 4,456,069, Cl. 166-303.000.
Vilain, Pol: *See—*
Mouzin, Gilbert; Cousse, Henri; and Vilain, Pol, 4,456,614, Cl. 424-278.000.
Vilati Villamos Automatika Fovallalkozo es Gyarto Vallalat: *See—*
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Viles, Alan H.: *See—*
Shaw, Edwin L.; and Viles, Alan H., 4,455,920, Cl. 92-12.200.
Vishay Intertechnology, Inc.: *See—*
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Voest-Alpine Aktiengesellschaft: *See—*
Wrulich, Herwig; Zitz, Alfred; Schetina, Otto; and Gekle, Siegmar, 4,456,306, Cl. 299-81.000.
Vogg, Gunther: *See—*
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Vogt, Peter, to INTERATOM Internationale Atomreaktorbau GmbH. Method and apparatus for the non-destructive measurement of the response pressure of reversible rupture discs. 4,455,871, Cl. 73-579.000.
Voirol, Peter: *See—*
Ruegg, Christoph; and Voirol, Peter, 4,456,653, Cl. 428-379.000.
Volk, Hans-Joachim: *See—*
Forkel Michael; and Volk, Hans-Joachim, 4,456,283, Cl. 280-804.000.
Volkmann, Jurgen; and Gross, Hans H., to Ing. Jurgen Volkmann, GmbH. Process and apparatus for the removal or controlled reduction of adherent films of liquid on hard surfaces. 4,455,706, Cl. 15-306.00A.
Volkswagenwerk Aktiengesellschaft: *See—*
Fiala, Ernst, 4,455,983, Cl. 123-478.000.
Schneider, Arthur, 4,456,106, Cl. 192-0.055.
Vollmar, Kurt, to Pfaff Industriemaschinen GmbH. Thread cutter for a zig-zag sewing machine. 4,455,957, Cl. 112-292.000.

von Bonin, Wulf: *See*—
Burgdorfer, Hans-Heribert; Schapel, Dietmar; Schneider, Gottfried; von Bonin, Wulf; and von Gizycki, Ulrich, 4,456,642, Cl. 428-68.000.

von Gizycki, Ulrich: *See*—
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Vosper, George W. Apparatus for shaping rope ends. 4,456,451, Cl. 425-392.000.

Voznick, Henry P.: *See*—
Junkert, Kenneth G.; and Voznick, Henry P., 4,456,390, Cl. 374-128.000.

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Lupova, Ljudmila M.; Fedorova, Lidia G.; Grebeshova, Renata N.; Aleshina, Zinaida P.; Anton, Alexandr G.; Belinsky, Alexandr L.; and Alexeeva, Margarita I., 4,456,544, Cl. 252-174.120.

W. R. Grace & Co.: *See*—
Guthrie, James L., 4,456,685, Cl. 435-109.000.
Welsh, William A., 4,456,693, Cl. 502-65.000.

Wacker Chemie GmbH: *See*—
Wagner, Wolfgang; Scherer, Matthias; Wegehaupt, Karl-Heinrich; and Frey, Volker, 4,456,542, Cl. 252-8.600.

Wada, Masaru: *See*—
Sugino, Takashi; Itoh, Kunio; Wada, Masaru; and Shimizu, Hirokazu, 4,456,999, Cl. 372-45.000.

Wagner, Hans: *See*—
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Wagner, Wolfgang; Scherer, Matthias; Wegehaupt, Karl-Heinrich; and Frey, Volker, to Wacker Chemie GmbH. Method for imparting hydrophobic properties to fibers. 4,456,542, Cl. 252-8.600.

Wahl Instruments, Inc.: *See*—
Junkert, Kenneth G.; and Voznick, Henry P., 4,456,390, Cl. 374-128.000.

Wahr, Johannes; and Kling, Guenter, to Daimler-Benz Aktiengesellschaft. Seal for liftable and lowerable windows, especially side windows for passenger cars or station wagons. 4,455,785, Cl. 49-488.000.

Wakai, Hideyuki, to Kabushiki Kaisha Komatsu Seisakusho. Method and device for detecting tool abnormality in machine tools. 4,456,960, Cl. 364-474.000.

Walden, Jack M.: *See*—
Olander Jr., Emil E.; James, Rex I.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,456,964, Cl. 364-710.000.

Walker, Richard E.; Heckelman, James D.; and Ziemke, Robert A. Detonating cord and continuity verification system. 4,455,941, Cl. 102-275.800.

Wallman, P. Henrik: *See*—
Spars, Byron G.; Tamm, Paul W.; and Wallman, P. Henrik, 4,456,504, Cl. 201-12.000.
Spars, Byron G.; Klett, Robert J.; and Wallman, P. Henrik, 4,456,525, Cl. 208-11.00R.

Wallner, Franz. Membrane osmometer. 4,455,864, Cl. 73-64.300.

Waltec, Inc.: *See*—
Leavens, William H., 4,456,021, Cl. 134-85.000.

Walz, Klaus; Schafer, Karl; Hoffarth, Gunther; and Schulze, Hans, to Bayer Aktiengesellschaft. Ammonium compounds. 4,456,554, Cl. 260-403.000.

Wambach, Christa, heiress: *See*—
Petruck, Gerd-Michael; Wambach, Paul R., deceased; and Wissner, Adolf, 4,456,777, Cl. 568-937.000.

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Wang, Chia-Lin J., to Du Pont de Nemours, E. I., and Company. 6-Keto- and 6-hydroxy-8-azaprostanoids and anti-ulcer use thereof. 4,456,613, Cl. 424-274.000.

Wanner, Karl: *See*—
Schmid, Wolfgang; Wanner, Karl; Falchle, Jorg; Bleicher, Manfred; and Muller, Frank, 4,456,076, Cl. 173-116.000.

Ward, Melvyn, to Lucas Industries. Method and apparatus for producing a friction element for a disc brake. 4,456,578, Cl. 419-8.000.

Warnecke, Irene. Balloon-catheter. 4,456,011, Cl. 128-325.000.

Warner, Bert J.: *See*—
Cullick, Alvin S.; Mathis, Melwyn L.; and Warner, Bert J., 4,455,860, Cl. 73-19.000.

Warner-Lambert Company: *See*—
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Warner, Thomas H.; and Cox, Charles H., III. I-V Curve tracer employing parametric sampling. 4,456,880, Cl. 324-158.00D.

Warshaw, Irwin. Stacked tray for slotted cards. 4,456,128, Cl. 211-11.000.

Wasco Products, Inc.: *See*—
Jentoft, Arthur P.; and Couture, Paul A., 4,455,799, Cl. 52-200.000.
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Watanabe, Hideaki: *See*—
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Watanabe, Hiroshi, to Futaba Denshi Kogyo Kabushiki Kaisha. Composite fluorescent display apparatus. 4,455,774, Cl. 40-451.000.

Watanabe, Kazuaki: *See*—
Kuranochi, Koujiro; Watanabe, Kazuaki; and Terakura, Yukio, 4,455,890, Cl. 74-783.000.

Watanabe, Kazuo; Makabe, Hachiro; Orii, Akira; Hisatake, Michio; and Yamamoto, Kazuji, to Janome Sewing Machine Co. Ltd. Sewing machine drive motor control system. 4,456,859, Cl. 318-313.000.

Watanabe, Kazuo: *See*—
Uchida, Shigeru; Watanabe, Kazuo; Ozawa, Kousaku; and Kawaharada, Minoru, 4,455,849, Cl. 72-41.000.

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Watanabe, Takao: *See*—
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Watanabe, Takeshi: *See*—
Sudo, Ryoichi; Miwa, Hiroaki; and Watanabe, Takeshi, 4,456,659, Cl. 428-447.000.

Watanabe, Tsuyoshi: *See*—
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Watkins, Bruce J., to Hughes Tool Company. Tieback connection method and apparatus. 4,456,070, Cl. 166-345.000.

Watson, Richard R., to Gilmore Valve Company. Relief gate valve. 4,456,028, Cl. 137-493.000.

Watson, Robert E.: *See*—
Olander Jr., Emil E.; James, Rex I.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,456,964, Cl. 364-710.000.

Wayman, Robert W.; Kawamoto, Mutsumi; and Sakakibara, Shiro, to Aisin-Warner K.K. Automotive transmission. 4,455,888, Cl. 74-689.000.

Weaver, Max A.; and Coates, Clarence A., Jr., to Eastman Kodak Company. Azo dyes from 2-amino-5-alkylthio-1,3,4-thiadiazoles and N-acyloxyalkyl-m-acylamidoanilines. 4,456,551, Cl. 260-158.000.

Webasto-Werk W. Baier GmbH & Co.: *See*—
Friedl, Reiner, 4,456,171, Cl. 237-12.30C.
Mittmann, Bernd, 4,456,423, Cl. 415-53.00R.

Weber, Georg; Eidenschink, Rudolf; and Erdmann, Dietrich, to Merck Patent Gesellschaft mit beschrankter Haftung. Dichroitic anthraquinone dyestuffs useful in liquid crystalline dielectrics and electro-optical indicator elements. 4,456,545, Cl. 252-299.100.

Weber, Gerhard M.: *See*—
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Weber, Harold J.: *See*—
Szymanski, Michael J.; Weber, Harold J.; Kuehnle, Manfred R.; and Fraser, Kenneth D., 4,456,367, Cl. 355-10.000.

Weber-Henning, Hans. Longitudinally adjustable ski pole. 4,456,285, Cl. 280-823.000.

Weber, Hermann, to Technsight Corporation. Mount for handling and masking optical materials. 4,455,964, Cl. 118-500.000.

Webers, Werner: *See*—
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Wedman, Leonard N.; and Bourque, Joseph A., to Kollmorgen Technologies Corporation. Linear positioning system. 4,456,934, Cl. 360-78.000.

Wegehaupt, Karl-Heinrich: *See*—
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Weiche, William J.: *See*—
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Weigl, James: *See*—
Clawson, Burrell E.; and Weigl, James, 4,456,008, Cl. 128-205.190.

Weigle, Dieter; Zirps, Wilhelm; and Schaub, Uwe, to Robert Bosch GmbH. Control valve. 4,456,170, Cl. 236-84.000.

Weil, Edward D.: *See*—
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Weintraub, Marvin H.: *See*—
Melotik, Donald J.; Weintraub, Marvin H.; and Anderson, Arnold E., 4,456,650, Cl. 428-290.000.

Weld Tooling Corporation: *See*—
Cable, Harold E.; and Rodrigues, Anil N., 4,456,228, Cl. 266-70.000.

Weller, David M.; Cook, R. James; and Wilkinson, Henry T., to United States of America, Agriculture. Method for screening bacteria and application thereof for field control of diseases caused by *Gaeumannomyces graminis*. 4,456,684, Cl. 435-34.000.

Weller, Harold N., III; and Gordon, Eric M., to E. R. Squibb & Sons, Inc. Carboxy and substituted carboxy aroly peptides. 4,456,595, Cl. 424-177.000.

Welsh, William A., to W. R. Grace & Co. Hydrocracking catalyst. 4,456,693, Cl. 502-65.000.

Welty, Kenneth B.: *See*—
McKnight, Hugh P.; Welty, Kenneth B.; and Dinius, Harold B., 4,456,115, Cl. 198-377.000.

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Olander Jr., Emil E.; James, Rex I.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,456,964, Cl. 364-710.000.

Wenzel, Robert J., to Alco Standard Corporation. Oven for cooking and flavoring meat products. 4,455,924, Cl. 99-333.000.

Werkzeugmaschinenfabrik Oerlikon-Buhrle AG: *See*—
Munzel, Klaus, 4,455,939, Cl. 102-215.000.

Wertz, Keith; and Graham, Emmette V., Jr. Ski rack wind deflector. 4,456,158, Cl. 224-316.000.

Westerby, Palle N. G. Unloading apparatus for silo. 4,456,156, Cl. 222-415.000.

Westinghouse Electric Corp.: *See*—
Binstock, Morton H.; McCloskey, Thomas H.; and Podolsky, Leaman B., 4,455,836, Cl. 60-663.000.
Dutta, Subhadra; and Raichoudhury, Prosenjit, 4,456,490, Cl. 148-1.500.
Guenther, Paul, 4,455,730, Cl. 29-252.000.
Henderson, James A.; and Marx, Gary E., 4,456,329, Cl. 350-96.160.
Heyne, Carl J.; and Hackworth, Donald T., 4,456,843, Cl. 310-68.00D.
Mallick, George T., Jr.; and Maynard, Pamela M., 4,456,867, Cl. 318-778.000.
Schaffner, Alfred C., 4,456,516, Cl. 204-217.000.
Williams, David W.; and Cricchi, James R., 4,455,742, Cl. 29-576.00B.

Westover, Dwight G., to Bell & Howell Company. Web advancement sensing methods and apparatus. 4,456,193, Cl. 242-75.420.

Wevers, Henk W.; Sorbie, Charles; and Saunders, Gerald A. B., to Queen's University at Kingston. Contracting bone clip. 4,456,006, Cl. 128-92.00B.

Wey, Robert A.: *See*—
Roberts, Harold A.; and Wey, Robert A., 4,456,159, Cl. 225-96.500.

Wheeler, Donald J.; Cooper, Christopher; and Krejsa, Charles R., to International Patents Limited. Controlled expansion strip accumulator. 4,456,189, Cl. 242-55.000.

White, George W.: *See*—
Johnson, Alfred O.; Rogness, Donald E.; and White, George W., 4,456,989, Cl. 370-94.000.

Whitehead, Graham K.; and Bates, Roger J., to Post Office, The. Improved communications cable with lines of weakness. 4,456,331, Cl. 350-96.230.

Whittaker Wolden B., to United States of America, Navy. Armament shorting arrangement. 4,455,916, Cl. 89-1.812.

Wichinsky, Louis. Security lock for coin operated machines. 4,455,846, Cl. 70-94.000.

Wichman, Paul E.: *See*—
Laakaniemi, Richard N.; and Wichman, Paul E., 4,456,168, Cl. 236-49.000.

Wiechert, Rudolf; Bittler, Dieter; Schleusener, Annerose; and Albring, Manfred, to Schering, Aktiengesellschaft (A.G.). Antiandrogenic 17α-alkyl steroids. 4,456,600, Cl. 424-238.000.

Wiechert, Rudolf: *See*—
Laurent, Henry; and Wiechert, Rudolf, 4,456,620, Cl. 424-331.000.

Wier, John P.; and Garrett, Robert A., to United States of America, Navy. Integrated wheelchair and ambulator. 4,456,086, Cl. 180-11.000.

Wier, Keith E.: *See*—
Frey, David J.; and Wier, Keith E., 4,456,574, Cl. 264-71.000.

Wiggins, Gene D., to S & W Instruments, Inc. Apparatus and method for measuring and displaying performance characteristics of reciprocating piston machines. 4,456,963, Cl. 364-551.000.

Wilber, Dennis A.: *See*—
Davenport, Clair H.; Combs, Richard B.; and Wilber, Dennis A., 4,455,865, Cl. 73-116.000.

Wilbs, Alfred. Hacksaw machine. 4,455,909, Cl. 83-777.000.

Wilkinson, Harold C.; Gum, Charles E.; Howe, Rodney C.; Macinskas, Dean P.; Pease, Charles C.; Raycher, Robert J.; Rosen, Ronald; and Williams, Francis J., to KSM Fastening Systems Inc. Microprocessor control of welding apparatus. 4,456,808, Cl. 219-98.000.

Wilkinson, Henry T.: *See*—
Weller, David M.; Cook, R. James; and Wilkinson, Henry T., 4,456,684, Cl. 435-34.000.

Williams, Augustus, to Finic, B.V. Method and apparatus for relining underground passageway. 4,456,401, Cl. 405-150.000.

Williams, David W.; and Cricchi, James R., to Westinghouse Electric Corp. Method of mating self-aligned memory MNOS-transistor. 4,455,742, Cl. 29-576.00B.

Williams, Floyd G., to Kybato, Inc. Quick coupling apparatus for interchangeable truck bodies. 4,456,414, Cl. 410-80.000.

Williams, Francis J.: *See*—
Wilkinson, Harold C.; Gum, Charles E.; Howe, Rodney C.; Macinskas, Dean P.; Pease, Charles C.; Raycher, Robert J.; Rosen, Ronald; and Williams, Francis J., 4,456,808, Cl. 219-98.000.

Williams, James E.; and Kozlowski, Edward R., to Wilson Research & Development, Inc. Removable head rotary tool for food processors. 4,456,184, Cl. 241-92.000.

Williams, Robert L. Toothbrush and tongue cleaner. 4,455,704, Cl. 15-111.000.

Williams, Thomas N., Jr.: *See*—
Giacobbe, Thomas J.; Williams, Thomas N., Jr.; and Horn, James M., 4,456,767, Cl. 562-414.000.

Willis, Ward L. Collapsable drum. 4,455,913, Cl. 84-412.000.

Wilson, Frank R.: *See*—
Bloomfield, Allen A.; and Wilson, Frank R., 4,456,187, Cl. 242-18.0PW.

Wilson Jones Company: *See*—
Denison, John F., 4,455,773, Cl. 40-352.000.

Wilson, Larry W.: *See*—
Kreager, William D.; Mason, Stanley I., Jr.; and Wilson, Larry W., 4,455,810, Cl. 53-451.000.

Wilson Research & Development, Inc.: *See*—
Williams, James E.; and Kozlowski, Edward R., 4,456,184, Cl. 241-92.000.

Winegeart, Mitchell E.; and Connelly, Lawrence, to Pet Tech-Dril Saf, Inc. Kelly valving apparatus. 4,456,217, Cl. 251-58.000.

Winona Tool Manufacturing Company: *See*—
Callanan, Dennis T.; Lawson, Gerald P.; and Reardon, Francis J., 4,455,900, Cl. 82-4.00A.

Winslow, John S., to Discovision Associates. Method and apparatus for storing information on a storage medium. 4,456,914, Cl. 346-76.00L.

Wintenberger, Michel G., to Pechiney. Process for purifying metals by segregation. 4,456,480, Cl. 75-63.000.

Wirsing, Howard L., to International Telephone and Telegraph Corporation. Digital switching network. 4,456,987, Cl. 370-58.000.

Wisser, Siegfried: *See*—
Henneberger, Helga; Seeliger, Christian; and Wisser, Siegfried, 4,456,951, Cl. 364-131.000.

Wisser, Adolf: *See*—
Petruck, Gerd-Michael; Wambach, Paul R., deceased; and Wissner, Adolf, 4,456,777, Cl. 568-937.000.

Witty, Thomas R.; and Astill, Mark E., to Becton Dickinson and Company. Competitive protein binding assay using an organosilane-silica gel separation medium. 4,456,689, Cl. 436-500.000.

Witwer, Keith A.; Moser, Keith W.; and Sanderson, Richard A., to Industra Products, Inc. Apparatus and method for placing coils and phase insulation in the slots of a dynamoelectric machine stator core member. 4,455,743, Cl. 29-596.000.

Wolf, Fritz J.: *See*—
Heim, Werner; Wolf, Fritz J.; and Savery, Winsor T., 4,456,065, Cl. 166-248.000.

Wolff, Horst, to Speck-Kolbenpumpen-Fabrik. High pressure plunger pump. 4,456,439, Cl. 417-454.000.

Wolmer, Roger: *See*—
Malikowski, Willi; Szulczyk, Andreas; Bohm, Wolfgang; and Wolmer, Roger, 4,456,662, Cl. 428-632.000.

Wolsdorf, Hans P.: *See*—
Opel, Paul; Herbst, Klaus; Brinkmann, Heinz; Luders, Albrecht; and Wolsdorf, Hans P., 4,456,308, Cl. 301-9.0DN.

Woltersdorf, Otto W., Jr., to Merck & Co., Inc. Benzothiazolesulfonamide derivatives for the topical treatment of elevated intraocular pressure. 4,456,599, Cl. 424-200.000.

Wombles, Robert H.; Gannon, Charles R.; and Carlos, Donald D., to Ashland Oil, Inc. Process for enhancing catalytic response of asphalt oxidation catalyst. 4,456,524, Cl. 208-5.000.

Wombles, Robert H.: *See*—
Carlos, Donald D.; Gannon, Charles R.; and Wombles, Robert H., 4,456,523, Cl. 208-5.000.

Wong, Thomas Y.: *See*—
Buckley, Leo P., Jr.; Chausse, Burnette P.; Chen, Arthur C.; Russell, John N.; and Wong, Thomas Y., 4,455,820, Cl. 60-39.030.

Woo, Ricky A.: *See*—
Nelson, Kenneth W.; Woo, Ricky A.; Palumbo, Patrick D.; and Collins, Michael L., 4,456,626, Cl. 426-553.000.

Wood, Thomas G.; and Oblack, Steven M., to E. R. Squibb & Sons, Inc. Powdered wax, tablet coated therewith and method. 4,456,629, Cl. 427-3.000.

Woodman, Howard C.: *See*—
Reeve, John C.; and Woodman, Howard C., 4,455,947, Cl. 105-377.000.

Word Corporation: *See*—
Szabo, Steve, Jr.; and Yaney, Noel A., 4,457,019, Cl. 455-41.000.

Woringer, Theo: *See*—
Matt, Bernhard; Woringer, Theo; and Zouzoulas, Gerassime, 4,455,840, Cl. 60-737.000.

Wreede, John E.: *See*—
Arns, James A.; Edwards, Timothy J.; Moss, Gaylord E.; and Wreede, John E., 4,456,328, Cl. 350-3.600.

Wright, Bernard S.: *See*—
Marsh, Susan K.; Owen, Hartley; and Wright, Bernard S., 4,456,781, Cl. 585-533.000.
Owen, Hartley; Marsh, Susan K.; and Wright, Bernard S., 4,456,779, Cl. 585-415.000.

Wright, William E., to Ethyl Corporation. Antioxidant diamine. 4,456,541, Cl. 252-50.000.

Wrobleski, James T., to Monsanto Company. Process for the manufacture of maleic anhydride. 4,456,764, Cl. 549-260.000.

Wroblowa, Halina S.: *See*—
Crosbie, Gary M.; Tennenhouse, Gerald J.; Tischer, Ragnar P.; and Wroblowa, Halina S., 4,456,631, Cl. 429-104.000.
Crosbie, Gary M.; Tennenhouse, Gerald J.; Tischer, Ragnar P.; and Wroblowa, Halina S., 4,456,664, Cl. 429-104.000.

Wrulich, Herwig; Zitz, Alfred; Schetina, Otto; and Gekle, Siegmar, to Voest-Alpine Aktiengesellschaft. Cooling system for cooling the bits of a cutting machine. 4,456,306, Cl. 299-81.000.

Wu, Schyi-Yi, to Motorola, Inc. Method of forming a shallow and high conductivity boron doped layer in silicon. 4,456,489, Cl. 148-1.500.

Wuchter, Gerhard, to Daimler-Benz Aktiengesellschaft. Combustion chamber for gas turbines. 4,455,839, Cl. 60-737.000.

Wurm, Jaroslav; and Kinast, John A., to Institute of Gas Technology. Heat-actuated heat pumping apparatus and process. 4,455,841, Cl. 62-6.000.

Wurtman, Richard J.: *See*—
Growdon, John H.; and Wurtman, Richard J., 4,456,598, Cl. 424-199.000.

Wyckoff, Stephen G., to Illinois Tool Works Inc. Shelf bracket retainer. 4,456,211, Cl. 248-544.000.

Wydeven, Theodore J.; and Katz, Moshe G., to United States of America, National Aeronautics and Space Administration. Method for the preparation of thin-skinned asymmetric reverse osmosis membranes and products thereof. 4,456,708, Cl. 521-141.000.

Xerox Corporation: *See*—
Buddendeck, Mark H., 4,456,236, Cl. 271-3.100.
Buddendeck, Mark H., 4,456,237, Cl. 271-3.100.
Hayes, Thomas A., Jr., 4,456,370, Cl. 355-14.0CH.
Herriman, Leland, 4,456,154, Cl. 222-325.000.

Xuan, Mai T.; and Grosjean, Michel, to Omega S.A. Method for slaving a stepping motor and arrangement for practising the method. 4,456,866, Cl. 318-696.000.

Yada, Isao: *See*—
Shigemura, Yutaka; Hisajima, Masahiko; Kimura, Hiroshi; Yada, Isao; Irie, Yoichiro; Morimoto, Kiyoshi; and Nagashima, Takashi, 4,456,673, Cl. 430-125.000.

Yago, Hidetaka: *See*—
Mizawa, Masayuki; and Yago, Hidetaka, 4,456,514, Cl. 204-181.00C.

Yamada, Junzo; Mano, Tsuneo; and Inoue, Junichi, to Nippon Telegraph & Telephone Public Corporation. Semiconductor memory device. 4,456,980, Cl. 365-200.000.

Yamada, Shigeru, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument of frequency modulation tone synthesis type. 4,455,911, Cl. 84-1.190.

Yamada, Takeshi; Ohashi, Hideki; and Tanimoto, Masahiro, to Horiba, Ltd. Automatic apparatus for analyzing metals. 4,456,580, Cl. 422-63.000.

Yamada, Tatsuzo, to Yamada, Tatsuzo; and Maeda Kiko Company Limited. Apparatus for applying pulling force to vehicle body. 4,455,859, Cl. 72-447.000.

Yamaguchi, Hideya: *See*—
Kubozuka, Takao; Ogawa, Naoki; and Yamaguchi, Hideya, 4,456,092, Cl. 181-290.000.

Yamaguchi, Hisashi: *See*—
Takahara, Kazuhiro; Kurahashi, Keizo; and Yamaguchi, Hisashi, 4,456,909, Cl. 340-781.000.

Yamaguchi, Kazuo: *See*—
Kawakita, Takao; Yamaguchi, Kazuo; and Date, Sadao, 4,456,577, Cl. 419-7.000.

Yamaguchi, Toshimitsu, to Fuji Photo Film Co., Ltd. Sheet material feeding apparatus. 4,456,239, Cl. 271-3.100.

Yamaichi Electric Mfg. Co., Ltd.: *See*—
Shibata, Sueji; and Umesato, Shoji, 4,456,318, Cl. 339-17.0CF.

Yamamichi, Masayoshi: *See*—
Hiramatsu, Akira; and Yamamichi, Masayoshi, 4,456,351, Cl. 354-402.000.

Yamamoto, Itaru: *See*—
Oshida, Jun-ichi; Nishikawa, Osamu; Tsuruta, Hideki; Takeshita, Toru; Yamamoto, Itaru; and Ishimaru, Kenji, 4,456,553, Cl. 260-397.200.

Yamamoto, Kazuji: *See*—
Watanabe, Kazuo; Makabe, Hachiro; Orii, Akira; Hisatake, Michio; and Yamamoto, Kazuji, 4,456,859, Cl. 318-313.000.

Yamamoto, Kimiyo: *See*—
Murakami, Masahiro; Kobayashi, Masateru; Yamamoto, Kimiyo; and Shibuya, Chisei, 4,456,754, Cl. 544-21.000.

Yamamoto, Nobuyuki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,456,661, Cl. 428-607.000.

Yamamoto, Sadashi; Kayama, Hiroaki; and Watanabe, Masaki, to Honda Giken Kogyo Kabushiki Kaisha. Vehicular brake operating system. 4,456,101, Cl. 188-196.0BA.

Yamamoto, Sakuei; and Nishida, Mitsuhiro, to Mitsubishi Denki Kabushiki Kaisha. Submergible motor construction. 4,456,844, Cl. 310-87.000.

Yamamoto, Yoshikazu; Sano, Kohzoh; Haneda, Kunio; and Yanagi, Toshiaki, to Brother Kogyo Kabushiki Kaisha. Cyclic sewing machine. 4,455,956, Cl. 112-274.000.

Yamamoto, Yoshiyuki; Inoue, Toshihide; and Yanagi, Masana, to Toray Industries, Inc. Flame retarding thermoplastic polyester. 4,456,719, Cl. 524-114.000.

Yamamura, Sakae; and Kawada, Shigeki, to Fanuc Limited. Method and apparatus for controlling AC motors. 4,456,868, Cl. 318-800.000.

Yamane, Hiroshi: *See*—
Kawamura, Teruaki; Komatsu, Yukihiko; and Yamane, Hiroshi, 4,455,726, Cl. 29-33.00T.

Yamatsu, Isao; Inai, Yuichi; Abe, Shinya; Watanabe, Hideaki; Igarashi, Toshiji; Shiojiri, Hiroyuki; Tanabe, Yoshio; and Hara, Kumiko, to Eisai Co., Ltd. Polyprenylcarboxylic acid amides useful for treating liver dysfunction. 4,456,603, Cl. 424-248.570.

Yamatsu, Isao: *See*—
Sato, Akio; Nakajima, Kenji; Takahara, Yoshimasa; Kijima, Shizumasa; Yamatsu, Isao; Suzuki, Kouichi; Suzuki, Takeshi; and Nakamura, Toshihiko, 4,456,558, Cl. 260-413.000.

Yamauchi, Kunihiro, to Konishiroku Photo Industry Co., Ltd. Copying machine equipped with a document detecting member. 4,456,372, Cl. 355-75.000.

Yamazaki, Etsuo: *See*—
Imazeki, Ryoji; Yamazaki, Etsuo; and Sasaki, Takao, 4,456,864, Cl. 315-578.000.
Imazeki, Ryoji; and Yamazaki, Etsuo, 4,456,962, Cl. 364-520.000.

Yamazaki, Kengo: *See*—
Nishimoto, Yoshiharu; and Yamazaki, Kengo, 4,456,646, Cl. 428-216.000.

Yamazaki, Kyuya: *See*—
Kamatani, Yoshio; Tanaka, Michio; Yamazaki, Kyuya; and Nishino, Kenichi, 4,456,744, Cl. 528-71.000.

Yanagi, Masana: *See*—
Yamamoto, Yoshiyuki; Inoue, Toshihide; and Yanagi, Masana, 4,456,719, Cl. 524-114.000.

Yanagi, Toshiaki: *See*—
Yamamoto, Yoshikazu; Sano, Kohzoh; Haneda, Kunio; and Yanagi, Toshiaki, 4,455,956, Cl. 112-274.000.

Yanagita, Tomoatsu; and Nagafuji, Motonobu, to Hitachi, Ltd. Alignment of one operand of a two operand arithmetic unit. 4,456,955, Cl. 364-200.000.

Yancy, Noel A.: *See*—
Szabo, Steve, Jr.; and Yancy, Noel A., 4,457,019, Cl. 455-41.000.

Yang, Kang, to Conoco Inc. Catalysts for alkoxylation reactions. 4,456,697, Cl. 502-171.000.

Yang, Wei-Lu. Tube's cap and the pierce structure of a sealed opening. 4,456,150, Cl. 222-83.000.

Yarborough, John M., Jr., to SRI International. Phase-lock loop and Miller decoder employing the same. 4,456,884, Cl. 329-50.000.

Yardley, Alfred: *See*—
Mortimer, Ivan; Farr, Glyn P. R.; and Yardley, Alfred, 4,456,104, Cl. 188-349.000.

Yasuda, Eturo; Akita, Shigeyuki; and Kodera, Masao, to Nippon Soken, Inc. Ultrasonic transmitting and receiving device. 4,456,848, Cl. 310-322.000.

Yasuhara, Seishi: *See*—
Kanegae, Hidetoshi; Kawamura, Yoshihisa; Nakajima, Masao; and Yasuhara, Seishi, 4,456,831, Cl. 290-38.00R.

Yazaki, Komei: *See*—
Fukushima, Masao; and Yazaki, Komei, 4,456,213, Cl. 248-559.000.

Yeager, Richard E.: *See*—
Temple, Davis L., Jr.; and Yeager, Richard E., 4,456,756, Cl. 544-364.000.

YHaslanger, Martin F.; Nakane, Masami; and Hall, Steven E., to E. R. Squibb & Sons, Inc. 7-Oxabicycloheptane substituted amino prostaglandin analogs and their use in inhibiting platelet aggregation and bronchoconstriction. 4,456,616, Cl. 424-285.000.

Yockey, Francis J.: *See*—
Olander Jr., Emil E.; James, Rex I.; Larson, Ivar W.; Covington, Wayne F.; Walden, Jack M.; Watson, Robert E.; Yockey, Francis J.; Wenninger, Fred, Jr.; and Russell, Homer C., 4,456,964, Cl. 364-710.000.

Yoshida, Hitoshi: *See*—
Nozawa, Masaei; Kamiya, Shigeru; and Yoshida, Hitoshi, 4,456,457, Cl. 55-283.000.

Yoshida Kogyo K. K.: *See*—
Hakoi, Tsutomu; and Murata, Shinji, 4,455,879, Cl. 73-862.010.
Oda, Kiyoshi, 4,455,722, Cl. 24-427.000.

Yoshida Kogyo K.K.: *See*—
Hosooka, Shuuichi; and Hori, Haruo, 4,455,800, Cl. 52-309.100.

Yoshida, Shinichi: *See*—
Nimura, Hitoshi; Kono, Makoto; and Yoshida, Shinichi, 4,456,695, Cl. 502-104.000.

Yoshikawa, Tadao; and Nishida, Shoji, to Hitachi Shipbuilding & Engineering Co., Ltd. Shield tunneling machine and earth removing apparatus therefor. 4,456,304, Cl. 299-33.000.

Yoshikawa, Tadao, to Hitachi Shipbuilding & Engineering Co., Ltd. Shield tunneling machine. 4,456,305, Cl. 299-33.000.

Yoshimi, Akiro; Kamiya, Michihiko; Kojima, Yasuhumi; Ootsuka, Fumio; and Matsushima, Takeo, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Automotive air conditioner having coating power control device. 4,456,055, Cl. 165-12.000.

Yoshino, Kenji: *See*—
Nambu, Junji; Yoshino, Kenji; Ariga, Nagao; Shimazu, Kyotaro; and Sato, Hiroyuki, 4,456,732, Cl. 525-65.000.

Yoshioka, Teruo; Naito, Shiro; Abe, Yuzo; and Uchida, Kuninobu, to Honda Giken Kogyo Kabushiki Kaisha. Method of assembling uniform-speed joint. 4,455,734, Cl. 29-434.000.

Young, Don H.; and Elmore, Austin E. Measuring and dispensing apparatus. 4,456,152, Cl. 222-309.000.

Young, Lewis B., to Mobil Oil Corporation. Extending zeolite catalyst life for disproportionation by treating with phosphorus and/or steam. 4,456,780, Cl. 585-475.000.

Young, Peter L.: *See*—
Stein, Barry F.; and Young, Peter L., 4,456,506, Cl. 204-15.000.

Yuasa, Kazuhiro, to Ricoh Company, Ltd. Charging device. 4,456,365, Cl. 355-3.0CH.

Yubakami, Keiichi; Takashima, Yuji; and Shimotsuma, Wataru, to Matsushita Electric Industrial Co., Ltd. Image forming process. 4,456,669, Cl. 430-45.000.

Yueh, William R., to General Dynamics, Pomona Division. Augmented proportional navigation in second order predictive scheme. 4,456,862, Cl. 318-561.000.

Zach, Hubert, to Micro Electronic Systems Inc. Multi-faced solder pot. 4,456,163, Cl. 228-56.000.

Zahnradfabrik Friedrichshafen, AG.: *See*—
Lang, Armin; and Cerny, Walter, 4,456,087, Cl. 180-142.000.

Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See*—
Beig, Willy, 4,455,885, Cl. 74-477.000.

Zandman, Felix, to Vishay Intertechnology, Inc. Method of making a precision resistor with improved temperature characteristics. 4,455,744, Cl. 29-610.00R.

Zanini, Walter D. Floor mounted guide and shim assembly for sliding doors. 4,455,709, Cl. 16-90.000.

Zato, Thomas J.: *See*—
Skerlos, Peter C.; Zato, Thomas J.; and Templin, Frank C., 4,456,925, Cl. 358-85.000.
Zaveri, Vikram H.: *See*—
Kluting, Bernd A.; and Zaveri, Vikram H., 4,456,300, Cl. 297-366.000.
Zeilinger, James G.: *See*—
Kern, Leon O.; Zeilinger, James G.; and Mueller, Gerald E., 4,456,271, Cl. 279-91.000.
Zell, Michael N.: *See*—
Steen, Michael J.; and Zell, Michael N., 4,456,936, Cl. 360-104.000.
Zenith Radio Corporation: *See*—
Skerlos, Peter C.; Zato, Thomas J.; and Templin, Frank C., 4,456,925, Cl. 358-85.000.
Zettl, Otto. Jr.; and Zettl, Otto, Sr. Chuck. 4,456,270, Cl. 279-62.000.
Zettl, Otto, Sr.: *See*—
Zettl, Otto, Jr.; and Zettl, Otto, Sr., 4,456,270, Cl. 279-62.000.
Zide, Robert M., to Pro-Line, Inc. Protective leg padding for athletic pants. 4,455,686, Cl. 2-23.000.
Ziemke, Robert A.: *See*—
Walker, Richard E.; Heckelman, James D.; and Ziemke, Robert A., 4,455,941, Cl. 102-275.800.
Zilinsky, Aharon. Rotary machine. 4,456,441, Cl. 418-147.000.
Zink, Ottmar: *See*—
Buhner, Ernst; Zink, Ottmar; and Hahn, Gunter, 4,456,229, Cl. 266-95.000.
Zirps, Wilhelm: *See*—
Weigle, Dieter; Zirps, Wilhelm; and Schaub, Uwe, 4,456,170, Cl. 236-84.000.
Zitz, Alfred: *See*—
Wrulich, Herwig; Zitz, Alfred; Schetina, Otto; and Gekle, Siegmar, 4,456,306, Cl. 299-81.000.
Zoecon Corporation: *See*—
Lee, Shy-Fuh; and Henrick, Clive A., 4,456,464, Cl. 71-87.000.
Lee, Shy-Fuh, 4,456,465, Cl. 71-87.000.
Zolffel, Michael; and Gaube, Johann, to Chemische Werke Huels Aktiengesellschaft. Separating the chlorination products from the reaction gases obtained by the chlorination of methane and methyl chloride. 4,456,778, Cl. 570-255.000.
Zollner, Christine: *See*—
Zollner, Dieter; Zollner, Christine; Lauterbach-Dammler, Inge; Koziol, Konrad; and Pilbrow, Malcolm F., 4,456,519, Cl. 204-290.00R.
Zollner, Dieter; Zollner, Christine; Lauterbach-Dammler, Inge; Koziol, Konrad; and Pilbrow, Malcolm F., to C. Conradty Nurnberg GmbH & Co. Regeneratable, non-consumable electrode for high temperature uses. 4,456,519, Cl. 204-290.00R.
Zouzoulas, Gerassime: *See*—
Matt, Bernhard; Woringer, Theo; and Zouzoulas, Gerassime, 4,455,840, Cl. 60-737.000.
Zuidam, Jan; van Nassau, Petrus J. M.; Bruls, Pierre G. M. B.; and Jonckers, Kees, to Unie van Kunstmestfabrieken, B.V. Process for the removal of urea, ammonia, and carbon dioxide from dilute aqueous solutions. 4,456,535, Cl. 210-750.000.
Zwierzelewski, Victor F. Fuel economizer. 4,455,988, Cl. 123-590.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF JUNE, 1984

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bayer Aktiengesellschaft: *See*—
Schaupp, Kurt; Reitz, Gunther; and Boehmke, Gunther, Re. 31,610, Cl. 106-90.000.

Beverung, Warren N., Jr.; and Partyka, Richard A., to Bristol-Myers Company. Optionally substituted 1,2,3,5-tetrahydroimidezo(2,1-b)-quinazolin-2-ones and 6(H)-1,2,3,4-tetrahydropyimido(2,1-b)quinazolin-2-ones. Re. 31,617, Cl. 544-250.000.

Boehmke, Gunther: *See*—
Schaupp, Kurt; Reitz, Gunther; and Boehmke, Gunther, Re. 31,610, Cl. 106-90.000.

Bringol, Charles R.; and Snyder, Gary F., to International Business Machines Corporation. Decreasing time duration of recorded speech. Re. 31,614, Cl. 381-35.000.

Bristol-Myers Company: *See*—
Beverung, Warren N., Jr.; and Partyka, Richard A., Re. 31,617, Cl. 544-250.000.

Charlston, Barry S.: *See*—
Wainwright, Paul; Green, Michael J.; and Charlston, Barry S., Re. 31,611, Cl. 252-25.000.

Green, Michael J.: *See*—
Wainwright, Paul; Green, Michael J.; and Charlston, Barry S., Re. 31,611, Cl. 252-25.000.

International Business Machines Corporation: *See*—
Bringol, Charles R.; and Snyder, Gary F., Re. 31,614, Cl. 381-35.000.

Lee, Robert L. Jaw movement simulation. Re. 31,615, Cl. 433-73.000.

LGZ Landis & Gyr Zug AG: *See*—
Lienhard, Heinz; and Schneider, Gernot, Re. 31,613, Cl. 324-117.00R.

Lienhard, Heinz; and Schneider, Gernot, to LGZ Landis & Gyr Zug AG. Measuring transformer. Re. 31,613, Cl. 324-117.00R.

Partyka, Richard A.: *See*—
Beverung, Warren N., Jr.; and Partyka, Richard A., Re. 31,617, Cl. 544-250.000.

RCA Corporation: *See*—
Sauer, Donald J., Re. 31,612, Cl. 307-221.00D.

Reitz, Gunther: *See*—
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596 4,455,743
610 R 4,455,744

CLASS 30

90.6 4,455,745
106 4,455,746
171 4,455,747

CLASS 33

1 B 4,455,749
1 CC 4,455,748
18 R 4,455,751
41 D 4,455,752
43 4,455,750
143 E 4,455,753
174 L 4,455,754
4,455,755
180 R 4,455,756
181 R 4,455,757
282 4,455,758
288 4,455,759
482 4,455,760

CLASS 34

14 4,455,761
170 4,455,762
233 4,455,763

CLASS 36

30 R 4,455,765
39 4,455,766
83 4,455,767
121 4,455,768
4,455,769
136 4,455,764

CLASS 37

86 4,455,770
142 A 4,455,771

CLASS 40

124.5 4,455,772
352 4,455,773
451 4,455,774
607 4,455,775

CLASS 42

1 ST 4,455,776
59 4,455,777

CLASS 43

8 4,455,778
17 4,455,779
42.04 4,455,780

CLASS 44

73 4,456,454

CLASS 47

1 R 4,455,784

CLASS 48

85.2 4,456,455

CLASS 49

488 4,455,785

CLASS 51

34 J 4,455,789
46 4,455,786
241 S 4,455,787
334 4,455,788

CLASS 52

4 4,455,790
12 4,455,791
90 4,455,792
91 4,455,793
98 4,455,794
155 4,455,795
172 4,455,796
179 4,455,797
200 4,455,798
4,455,799
309.1 4,455,800
309.9 4,455,801
317 4,455,802
395 4,455,803
698 4,455,804
712 4,455,805
732 4,455,806
770 4,455,807

CLASS 53

373 4,455,808
435 4,455,809
451 4,455,810

CLASS 55

203 4,456,456
283 4,456,457
306 4,456,458

CLASS 56

10.8 4,455,811
11.5 4,455,812
11.8 4,455,813
126 4,455,814
235 4,455,815
249 4,455,816

CLASS 57

18 4,455,817
293 4,455,818
404 4,455,819

CLASS 60

39.03 4,455,820
39.091 4,455,821
39.822 4,455,822
311 4,455,823
507 4,455,824
517 4,455,825
526 4,455,826
547.1 4,455,827
4,455,828
4,455,829
562 4,455,830
574 4,455,831
581 4,455,832
641.15 4,455,833
659 4,455,834
4,455,835
663 4,455,836
670 4,455,837
711 4,455,838
737 4,455,839
4,455,840

CLASS 62

6 4,455,841
9 4,456,459
26 4,456,460
28 4,456,461
64 4,455,842
73 4,455,843

CLASS 65

158 4,456,462

CLASS 68

18 F 4,455,844
204 4,455,845

CLASS 70

94 4,455,846
284 4,455,847

CLASS 71

29 4,456,463
87 4,456,464
4,456,465
88 4,456,466
4,456,467
4,456,468
93 4,456,469
94 4,456,470
118 4,456,471
4,456,472

CLASS 72

12 4,455,848
41 4,455,849
46 4,455,850
76 4,455,851
82 4,455,852
84 4,455,853
90 4,455,854
178 4,455,855
236 4,455,856
320 4,455,857
324 4,455,858
447 4,455,859

CLASS 73

19 4,455,860
23 4,455,861
35 4,455,862
40.5 A 4,455,863
64.3 4,455,864
116 4,455,865
117 4,455,866
119 A 4,455,867
4,455,868
151 4,455,869
223 4,455,870
579 4,455,871
618 4,455,872
629 4,455,873
704 4,455,874
708 4,455,875
747 4,455,876
861.22 4,455,877
4,455,878
862.01 4,455,879
862.56 4,455,880
863.21 4,455,881
864.65 4,455,882

CLASS 74

475 4,455,883
477 4,455,884
4,455,885
531 4,455,886
573 R 4,455,887
689 4,455,888
713 4,455,889
783 4,455,890
793 4,455,891
869 4,455,892

CLASS 75

0.5 A 4,456,473
4,456,474
0.5 AA 4,456,475
46 4,456,476
51 4,456,477
53 4,456,478
63 4,456,479
4,456,480
82 4,456,481
126 C 4,456,482
128 N 4,456,483
252 4,456,484

CLASS 76

107 R 4,455,893

CLASS 81

3.1 R 4,455,894
3.46 R 4,455,895
57.26 4,455,896
61 4,455,897
454 4,455,898
466 4,455,899

CLASS 82

4 A 4,455,900
12 4,455,901

CLASS 83

150 4,455,902
346 4,455,903
375 4,455,904
422 4,455,905
438 4,455,906
4,455,907
767 4,455,908
777 4,455,909
874 4,455,910

CLASS 84

1.19 4,455,911
177 4,455,912
412 4,455,913

CLASS 86

1 R 4,455,914
46 4,455,915

CLASS 89

1.812 4,455,916
1.817 4,455,917
41 L 4,455,918
138 4,455,919

CLASS 91

191 4,455,921
358 A 4,455,922
394 4,455,923

CLASS 92

12.2 4,455,920

CLASS 99

333 4,455,924
422 4,455,925
4,455,926
425 4,455,927
533 4,455,928
637 4,455,929

CLASS 100

3 4,455,930
37 4,455,931
214 4,455,932

CLASS 101

27 4,455,933
35 4,455,934
4,455,935
93.14 4,455,936
93.15 4,455,937
148 4,455,938

CLASS 102

215 4,455,939
228 4,455,940
275.8 4,455,941
444 4,455,942
489 4,455,943
530 4,455,944

CLASS 104

23 FS 4,455,945

CLASS 105

168 4,455,946
377 4,455,947

CLASS 106

90 Re.31,610
288 Q 4,456,485
291 4,456,486

CLASS 108

44 4,455,948

CLASS 110

263 4,455,949

CLASS 111

2 4,455,950

CLASS 112

84 4,455,951
121.12 4,455,952
262.1 4,455,953
262.3 4,455,954
274 4,455,955
4,455,956
292 4,455,957

CLASS 114

40 4,455,958
90 4,455,959
151 4,455,960
254 4,455,961
312 4,455,962

CLASS 116

306 4,455,963

CLASS 118

500 4,455,964
622 4,455,965

CLASS 119

3 4,455,966
58 4,455,967

CLASS 122

4 D 4,455,968
4,455,969
20 B 4,455,970

CLASS 123

41.7 4,455,971
41.74 4,455,972
41.76 4,455,973
47 R 4,455,974
52 MV 4,455,975
197 A 4,455,976
198 DC 4,455,977
339 4,455,978
407 4,455,979
425 4,455,980
438 4,455,981
472 4,455,982
478 4,455,983
481 4,455,984
494 4,455,985
557 4,455,986
569 4,455,987
590 4,455,988
620 4,455,989

CLASS 124

86 4,455,990

CLASS 126

9 R 4,455,991
4,455,992
64 4,455,993
123 4,455,994
4,455,995
200 4,455,996
367 4,455,997
433 4,455,998
445 4,455,999

CLASS 128

1 D 4,456,000
1.5 4,456,001
77 4,456,002
80 F 4,456,003
92 A 4,456,004
4,456,005
92 B 4,456,006
200.21 4,456,007
205.19 4,456,008
310 4,456,010
325 4,456,011
420 R 4,456,012
675 4,456,013
719 4,456,014
721 4,456,015
725 4,456,016
772 4,456,017

CLASS 131

116 4,456,018

CLASS 132

5 4,456,019
34 C 4,456,020

CLASS 134

31 4,456,487
85 4,456,021
99 4,456,022

CLASS 135

25 R 4,456,023

CLASS 136

244 4,456,782
246 4,456,783

CLASS 137

62 4,456,024
115 4,456,025
315 4,456,026
375 4,456,027
493 4,456,028
498 4,456,029
614.11 4,456,030
625.62 4,456,031
630.19 4,456,032

CLASS 138

42 4,456,033
122 4,456,034

CLASS 139

398 4,456,035

CLASS 140

105 4,456,036

CLASS 141

1 4,456,037
95 4,456,038
98 4,456,039
150 4,456,040
329 4,456,041

CLASS 144

129 4,456,042
136 C 4,456,043
193 D 4,456,044
373 4,456,045

CLASS 148

1.5 4,456,488
4,456,489
4,456,490
2 4,456,491

CLASS 149

8 4,456,492
19.4 4,456,493
21 4,456,494

CLASS 152

209 R 4,456,046
213 A 4,456,047
330 RF 4,456,048

CLASS 156

166 4,456,495
249 4,456,496
257 4,456,497
275.5 4,456,498
605 4,456,499
634 4,456,500
643 4,456,501

CLASS 160

176 R 4,456,049
231 4,456,050

CLASS 162

133 4,456,502
261 4,456,503

CLASS 164

131 4,456,051
416 4,456,052
421 4,456,053
454 4,456,054

CLASS 165

12 4,456,055
45 4,456,056
95 4,456,057
154 4,456,058
173 4,456,059

CLASS 166

68.5 4,456,060
75 R 4,456,061
84 4,456,062
4,456,063
123 4,456,064
248 4,456,065
272 4,456,066
279 4,456,067
303 4,456,068
4,456,069
345 4,456,070
356 4,456,071
362 4,456,072
367 4,456,073

CLASS 172

7 4,456,074
25 4,456,075

CLASS 173

116 4,456,076
147 4,456,077

CLASS 174

23 R 4,456,784
105 SC 4,456,785
152 GM 4,456,786

CLASS 175

20 4,456,078
58 4,456,079
61 4,456,080
297 4,456,081
384 4,456,082
415 4,456,083

CLASS 177

141 4,456,084
256 4,456,085

CLASS 178

19 4,456,787

CLASS 179

7.1 R 4,456,788
18 BC 4,456,789
4,456,792
18 ES 4,456,790
18 FA 4,456,791
99 R 4,456,793
103 4,456,794
107 H 4,456,795
111 E 4,456,796
156 R 4,456,797

CLASS 180

11 4,456,086
142 4,456,087
168 4,456,088
180 4,456,089
219 4,456,090

CLASS 181

282 4,456,091
290 4,456,092

CLASS 182

2 4,456,093
20 4,456,094
200 4,456,095

CLASS 187

29 R 4,456,096
4,456,097

CLASS 188

1.11 4,456,098
71.6 4,456,099
77 R 4,456,100
196 BA 4,456,101
326 4,456,103
331 4,456,102
349 4,456,104

CLASS 190

115 4,456,105

CLASS 192

0.055 4,456,106
3.31 4,456,107
4 A 4,456,108
18 A 4,456,109
82 T 4,456,110
85 CA 4,456,111
150 4,456,112

CLASS 193

7 4,456,113

CLASS 198

377 4,456,114
4,456,115
414 4,456,116
461 4,456,117
480 4,456,118
535 4,456,119
648 4,456,120
750 4,456,121

CLASS 200

5 A 4,456,798
4,456,800
5 R 4,456,799
83 P 4,456,801
340 4,456,802

CLASS 201

12 4,456,504

CLASS 202

133 4,456,505

CLASS 204

15 4,456,506
27 4,456,508
59 R 4,456,509
101 4,456,510
157.1 R 4,456,511
162 R 4,456,512
180 R 4,456,513
181 C 4,456,514
181 T 4,456,507
192 P 4,456,515
217 4,456,516
286 4,456,517
290 F 4,456,518
290 R 4,456,519
291 4,456,520
292 4,456,521
416 4,456,522

CLASS 206

45.34 4,456,122
343 4,456,123
463 4,456,124
513 4,456,125
573 4,456,126

CLASS 208

5 4,456,523
4,456,524
11 R 4,456,525
48 AA 4,456,526
89 4,456,527

CLASS 209

49 4,456,528
564 4,456,127

CLASS 210

306 4,456,529
396 4,456,530
409 4,456,531
602 4,456,532
708 4,456,533
725 4,456,534
750 4,456,535
776 4,456,536

CLASS 211

11 4,456,128
13 4,456,129
26 4,456,130

CLASS 212

97 4,456,131
160 4,456,132

CLASS 213

62 R 4,456,133

CLASS 215

12 R 4,456,134
100 A 4,456,135
216 4,456,136
230 4,456,137
232 4,456,138
252 4,456,139
364 4,456,140

CLASS 219

8.5 4,456,803
10.43 4,456,804
10.55 F 4,456,805
10.55 M 4,456,806
10.77 4,456,807
98 4,456,808
108 4,456,809
110 4,456,810
121 LM 4,456,811
4,456,812
130.21 4,456,813
137.71 4,456,814
225 4,456,815
242 4,456,816
263 4,456,817
300 4,456,186
373 4,456,818
391 4,456,819
398 4,456,820

CLASS 220

1 T 4,456,141
4 F 4,456,142
214 4,456,143
222 4,456,144
242 4,456,145
270 4,456,146

CLASS 221

67 4,456,147
132 4,456,148

CLASS 222

1 4,456,149
83 4,456,150
146 HE 4,456,151
309 4,456,152
321 4,456,153
325 4,456,154
396 4,456,155
415 4,456,156
591 4,456,157

CLASS 224

316 4,456,158

CLASS 225

96.5 4,456,159

CLASS 226

195 4,456,160

CLASS 227

67 4,456,161
4,456,162

CLASS 228

56 4,456,163

CLASS 229

43 4,456,164

CLASS 232

15 4,456,165

CLASS 235

78 R 4,456,821

CLASS 236

13 4,456,166
49 4,456,168
78 D 4,456,169
84 4,456,170
345 4,456,167

CLASS 237

12.3 C 4,456,171
66 4,456,172
67 4,456,173

CLASS 239

8 4,456,174
113 4,456,175
142 4,456,176
209 4,456,177
265.39 4,456,178
338 4,456,179
397 4,456,180
403 4,456,181

CLASS 241

46.02 4,456,182
46.17 4,456,183
92 4,456,184
4,456,185

CLASS 242

18 PW 4,456,187
35.5 R 4,456,188
55 4,456,189
56 R 4,456,190
68.1 4,456,191
4,456,209
74.1 4,456,192
75.42 4,456,193
84.2 A 4,456,194
107.4 B 4,456,195
107.6 4,456,196
130.4 4,456,197
156.2 4,456,198
158 R 4,456,199
185 4,456,200
203 4,456,201

CLASS 244

3.15 4,456,202
23 D 4,456,203
53 B 4,456,204
110 C 4,456,205
118.5 4,456,206
137 R 4,456,207
158 A 4,456,208

CLASS 248

205.5 4,456,210
544 4,456,211
558 4,456,212
559 4,456,213

CLASS 249

144 4,456,214

CLASS 250

223 R 4,456,822
252.1 4,456,823
318 4,456,824
324 4,456,825
370 4,456,826
506.1 4,456,827
551 4,456,828
560 4,456,829

CLASS 251

1 B 4,456,215
11 4,456,216
58 4,456,217
61.5 4,456,218
99 4,456,219
144 4,456,220
152 4,456,221
230 4,456,222
342 4,456,223

CLASS 252

8.55 R 4,456,537
8.6 4,456,542
25 Re.31,611
32.7 E 4,456,538
46.7 4,456,539
48.6 4,456,540
50 4,456,541
106 4,456,543
174.12 4,456,544
299.1 4,456,545
373 4,456,546
500 4,456,548
518 4,456,549

CLASS 254

89 R 4,456,224
134.3 FT 4,456,225
264 4,456,226
350 4,456,227

CLASS 260

112 R 4,456,550
158 4,456,551
377 4,456,552
397.2 4,456,553
403 4,456,554
410 4,456,555
412.4 4,456,556
4,456,557
413 4,456,558
429.7 4,456,559
455 A 4,456,560
464 4,456,561
465 F 4,456,562
465.8 R 4,456,563
504 S 4,456,564
545 R 4,456,565
984 4,456,566
985 4,456,567

CLASS 261

39 A 4,456,568

CLASS 264

4.7 4,456,569
22 4,456,570
45.5 4,456,571
53 4,456,572
71 4,456,573
176 F 4,456,574
255 4,456,575
4,456,576

CLASS 266

70 4,456,228
95 4,456,229
143 4,456,230
215 4,456,231

CLASS 267

54 B 4,456,232
70 4,456,233

CLASS 270

18 4,456,234

CLASS 271

3.1 4,456,235
4,456,236
4,456,237
4,456,238
4,456,239
4 4,456,240
11 4,456,241
94 4,456,242
245 4,456,243

CLASS 272

92 4,456,244
118 4,456,245
4,456,246
126 4,456,247
134 4,456,248
139 4,456,249

CLASS 273

26 R 4,456,250
29 A 4,456,251
4,456,252
51 4,456,253
73 A 4,456,254
84 R 4,456,255
4,456,256
186 R 4,456,257
241 4,456,258
256 4,456,259
4,456,260
271 4,456,261
358 4,456,262
393 4,456,263
404 4,456,264
425 4,456,265

CLASS 277

24 4,456,266
30 4,456,267
106 4,456,268
212 FB 4,456,269

CLASS 279

62 4,456,270
91 4,456,271

CLASS 280

12 S 4,456,272
33.99 H 4,456,273
96.1 4,456,274
163 4,456,275
257 4,456,276
282 4,456,277
402 4,456,278
415 A 4,456,279
444 4,456,280
628 4,456,281
690 4,456,282
804 4,456,283
812 4,456,284
823 4,456,285

CLASS 281

15 B 4,456,286

CLASS 285

281 4,456,287
321 4,456,288

CLASS 290

27 4,456,830
38 R 4,456,831

CLASS 292

28 4,456,289
337 4,456,290
338 4,456,291

CLASS 294

65.5 4,456,292
106 4,456,293

CLASS 297

21 4,456,294
211 4,456,295
239 4,456,296
316 4,456,297
353 4,456,298
366 4,456,300
440 4,456,299
445 4,456,301
488 4,456,302

CLASS 299

10 4,456,303
33 4,456,304
4,456,305
81 4,456,306
93 4,456,307

CLASS 301

9 DN 4,456,308

CLASS 303

10 4,456,309
4,456,310
4,456,311

CLASS 307

38 4,456,832
80 4,456,833
91 4,456,834
107 4,456,835
221 D Re.31,612
252 C 4,456,836
262 4,456,837
264 4,456,838
315 4,456,839
362 4,456,840
530 4,456,841

CLASS 308

6 C 4,456,312
202 4,456,313
236 4,456,314

CLASS 310

61 4,456,842
68 D 4,456,843
87 4,456,844
90 4,456,845
233 4,456,846
313 R 4,456,847
322 4,456,848
324 4,456,849
4,456,850

CLASS 312

137 4,456,315
229 4,456,316

CLASS 313

250 4,456,851
348 4,456,852
421 4,456,853

CLASS 315

58 4,456,854
308 4,456,855
360 4,456,857
408 4,456,856

CLASS 318

138 4,456,858
313 4,456,859
561 4,456,860
4,456,862
568 4,456,861
572 4,456,863
578 4,456,864
599 4,456,865
696 4,456,866
778 4,456,867
800 4,456,868

CLASS 320

38 4,456,869

CLASS 322

29 4,456,870

CLASS 323

217 4,456,871
286 4,456,872

CLASS 324

51 4,456,873
4,456,874
55 4,456,875
77 K 4,456,877
77 R 4,456,876
117 R Re.31,613
142 4,456,878
158 D 4,456,879
4,456,880
319 4,456,881
321 4,456,882
464 4,456,883

CLASS 329

50 4,456,884

CLASS 330

107 4,456,885
254 4,456,886
261 4,456,887
277 4,456,888

279 4,456,889

CLASS 331

1 A 4,456,890
3 4,456,891
176 4,456,892

CLASS 333

18 4,456,893
22 R 4,456,894
174 4,456,895

CLASS 335

203 4,456,896
205 4,456,897
217 4,456,898

CLASS 336

55 4,456,899
221 4,456,900

CLASS 338

4 4,456,901
34 4,456,902

CLASS 339

14 R 4,456,317
17 CF 4,456,318
92 R 4,456,319
94 M 4,456,320
97 R 4,456,321
153 4,456,322
177 R 4,456,323
4,456,324
256 RT 4,456,325
272 A 4,456,326

CLASS 340

54 4,456,903
347 AD 4,456,904
347 DD 4,456,905
516 4,456,906
629 4,456,907
644 4,456,908
781 4,456,909
784 4,456,910

CLASS 343

5 PD 4,456,911
6 R 4,456,912
361 4,456,913

CLASS 346

76 L 4,456,914
76 PH 4,456,915
140 R 4,456,916

CLASS 350

3.6 4,456,327
4,456,328
96.16 4,456,329
96.18 4,456,330
96.23 4,456,331
289 4,456,333
320 4,456,332
4,456,334
331 R 4,456,335
338 4,456,336
357 4,456,337
358 4,456,338
403 4,456,339
422 4,456,340
427 4,456,341
430 4,456,342
444 4,456,343
452 4,456,344
469 4,456,345

CLASS 351

153 4,456,346
158 4,456,347
212 4,456,348

CLASS 352

91 C 4,456,349

CLASS 353

108 4,456,350

CLASS 354

195.1 4,456,360
195.13 4,456,356
266 4,456,357
285 4,456,358
299 4,456,355
312 4,456,359
402 4,456,351
414 4,456,353
4,456,354
429 4,456,352
443 4,456,361

CLASS 355

3 CH 4,456,365
3 DD 4,456,364
3 FU 4,456,368
3 R 4,456,362
4,456,363
8 4,456,366
10 4,456,367
14 CH 4,456,370
14 SH 4,456,369
71 4,456,371
75 4,456,372
133 4,456,373

CLASS 356

237 4,456,374
239 4,456,375
350 4,456,376
4,456,377
373 4,456,378
381 4,456,379
418 4,456,380

CLASS 357

14 4,456,917
22 4,456,918
28 A 4,456,919
46 4,456,920

CLASS 358

31 4,456,921
4,456,922
64 4,456,923
75 4,456,924
85 4,456,925
111 4,456,926
153 4,456,927
181 4,456,928
213 4,456,929
328 4,456,930
335 4,456,931

CLASS 360

36.1 4,456,932
49 4,456,933
78 4,456,934
97 4,456,935
104 4,456,936
106 4,456,937
109 4,456,938

CLASS 361

56 4,456,939
4,456,940
105 4,456,941
127 4,456,942
160 4,456,943
212 4,456,944
305 4,456,945

CLASS 362

15 4,456,946
267 4,456,947
268 4,456,948

CLASS 363

26 4,456,949
4,456,950

CLASS 364

131 4,456,951
200 4,456,952
4,456,953
4,456,954
4,456,955
4,456,956
4,456,957
4,456,958
417 4,456,959
474 4,456,960
513 4,456,961
520 4,456,962
551 4,456,963
710 4,456,964
900 4,456,965
4,456,966
4,456,967
4,456,968
4,456,969
4,456,970
4,456,971
4,456,972
4,456,973

CLASS 365

2 4,456,974
36 4,456,975
49 4,456,976
51 4,456,977
184 4,456,978
190 4,456,979
200 4,456,980
234 4,456,981

CLASS 366

97 4,456,381
276 4,456,382

CLASS 367

11 4,456,982
69 4,456,983

CLASS 368

9 4,456,383
10 4,456,384
187 4,456,385
201 4,456,386
230 4,456,387
294 4,456,388

CLASS 369

170 4,456,984

CLASS 370

30 4,456,985
4,456,986
58 4,456,987
4,456,991
75 4,456,988
94 4,456,989
119 4,456,990

CLASS 371

6 4,456,992
10 4,456,993
16 4,456,994
21 4,456,995
37 4,456,996
68 4,456,997

CLASS 372

45 4,456,998
4,456,999
58 4,457,000
59 4,457,001

CLASS 373

95 4,457,002

CLASS 374

31 4,456,389
128 4,456,390

CLASS 375

1 4,457,003
67 4,457,004
82 4,457,005
87 4,457,006
102 4,457,007

CLASS 377

18 4,457,008

CLASS 378

19 4,457,009
167 4,457,010

CLASS 381

2 4,457,011
3 4,457,012
35 Re.31,614
46 4,457,013
98 4,457,014

CLASS 382

45 4,457,015
59 4,457,016
65 4,457,017

CLASS 384

307 4,456,391

CLASS 400

120 4,456,392
124 4,456,393
4,456,394
559.1 4,456,395

CLASS 403

15 4,456,396

CLASS 404

25 4,456,397
69 4,456,398
100 4,456,399

CLASS 405

128 4,456,400
150 4,456,401
186 4,455,718
196 4,456,402
4,456,403
4,456,404
288 4,456,405

CLASS 406

88 4,456,406

CLASS 407

7 4,456,407
35 4,456,408
104 4,456,409

CLASS 408

76 4,456,410
223 4,456,411

CLASS 409

233 4,456,412

CLASS 410

56 4,456,413
80 4,456,414
129 4,456,415

CLASS 411

358 4,456,416

CLASS 414

22 4,456,417
351 4,456,418
398 4,456,419
478 4,456,420
546 4,456,421
744 A 4,456,422

CLASS 415

53 R 4,456,423
121 G 4,456,424
122 R 4,456,425
219 R 4,456,426

CLASS 416

95 4,456,427
97 R 4,456,428
117 4,456,429
170 R 4,456,430
189 4,456,431

CLASS 417

2 4,456,432
53 4,456,433
218 4,456,434
302 4,456,435
366 4,456,436
368 4,456,437
403 4,456,438
454 4,456,439
540 4,456,440

CLASS 418

147 4,456,441
153 4,456,442

CLASS 419

7 4,456,577
8 4,456,578

CLASS 420

566 4,456,579

CLASS 422

63 4,456,580
72 4,456,581

CLASS 423

277 4,456,582
4,456,583
644 4,456,584

CLASS 424

49 4,456,585
70 4,456,586
78 4,456,587
92 4,456,588
95 4,456,589
101 4,456,590
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177 4,456,592
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180 4,456,596
195 4,456,597
199 4,456,598
200 4,456,599
238 4,456,600
241 4,456,601
243 4,456,602
248.57 4,456,603
250 4,456,604
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258 4,456,606
262 4,456,607
269 4,456,608
270 4,456,609
272 4,456,612
273 R 4,456,610
274 4,456,611
4,456,613
278 4,456,614
285 4,456,615
4,456,616
4,456,617
308 4,456,618
324 4,456,619
331 4,456,620

CLASS 425

4 R 4,456,443
8 4,456,444
78 4,456,445
102 4,456,446
182 4,456,447
234 4,456,448
253 4,456,449
376 R 4,456,450
392 4,456,451

CLASS 426

3 4,456,621
17 4,456,622
69 4,456,623
96 4,456,624
106 4,456,625
553 4,456,626
603 4,456,627

CLASS 427

3 4,456,628
4,456,629
88 4,456,630
124 4,456,632
138 4,456,633
228 4,456,634
230 4,456,635
240 4,456,636
355 4,456,637

CLASS 428

1 4,456,638
13 4,456,639
31 4,456,640
35 4,456,641
68 4,456,642
156 4,456,643
158 4,456,644
166 4,456,645
216 4,456,646
4,456,647
283 4,456,648
285 4,456,649
290 4,456,650
324 4,456,651
344 4,456,652
379 4,456,653
383 4,456,654
4,456,655
415 4,456,657
424.6 4,456,658
447 4,456,659
516 4,456,660
607 4,456,661
632 4,456,662
653 4,456,663

CLASS 429

104 4,456,631
4,456,664
105 4,456,665
245 4,456,666

CLASS 430

10 4,456,667
17 4,456,668
45 4,456,669
49 4,456,670
58 4,456,671
59 4,456,672
125 4,456,673
221 4,456,674
256 4,456,675
258 4,456,680
264 4,456,676
276 4,456,677
279 4,456,678
326 4,456,679
505 4,456,681
523 4,456,682

CLASS 433

73 Re.31,615

CLASS 435

3 4,456,683
34 4,456,684
109 4,456,685
119 4,456,686
241 4,456,687
267 4,456,688

CLASS 436

500 4,456,689
4,456,690
543 4,456,691

CLASS 446

71 4,455,783
155 4,455,782
241 4,455,781

CLASS 455

33 4,457,018
41 4,457,019
70 4,457,020
186 4,457,021
317 4,457,022

CLASS 501

41 4,456,692

CLASS 502

65 4,456,693
74 4,456,694
104 4,456,695
117 4,456,547
167 4,456,696
171 4,456,697
203 4,456,698
208 4,456,699
220 4,456,700
221 4,456,701
314 4,456,702
335 4,456,703

CLASS 521

79 4,456,704
83 4,456,705
89 4,456,706
99 4,456,707
141 4,456,708
160 4,456,709

CLASS 523

200 4,456,710
206 4,456,711
414 Re.31,616
439 4,456,712
455 4,456,713

CLASS 524

56 4,456,714
100 4,456,715
104 4,456,716
109 4,456,717
114 4,456,718
4,456,719
176 4,456,720
288 4,456,721
413 4,456,722
415 4,456,723
458 4,456,724
476 4,456,725
501 4,456,726
511 4,456,727
522 4,456,728
542 4,456,729
839 4,456,730

CLASS 525

61 4,456,731
65 4,456,732
71 4,456,733
310 4,456,734
317 4,456,735
392 4,456,736
398 4,456,737
454 4,456,738
510 4,456,739
528 4,456,740

CLASS 526

264 4,456,741

CLASS 528

45 4,456,742
60 4,456,743
71 4,456,744
85 4,456,745
128 4,456,746
254 4,456,747

CLASS 536

27 4,456,748
30 4,456,749
59 4,456,750
91 4,456,751

CLASS 544

20 4,456,753
21 4,456,754
23 4,456,755
116 4,456,752
250 Re.31,617
364 4,456,756

CLASS 546

139 4,456,757
284 4,456,758

CLASS 548

453 4,456,759
508 4,456,760
532 4,456,761

CLASS 549

56 4,456,762
249 4,456,763
260 4,456,764
332 4,456,765

CLASS 560

17 4,456,766

CLASS 562

414 4,456,767
503 4,456,768

CLASS 564

226 4,456,769

CLASS 568

315 4,456,770
4,456,771
424 4,456,772
608 4,456,773
872 4,456,774
885 4,456,775
899 4,456,776
937 4,456,777

CLASS 570

255 4,456,778

CLASS 585

415 4,456,779
475 4,456,780
533 4,456,781

CLASS 604

152 4,456,009

CLASSIFICATION OF DESIGNS

D2—	230	274,384		360	274,401	D11—	44	274,418	D15—	7	274,433		215	274,448		8	274,464
	234	274,385		391	274,402		105	274,417		14	274,432		230	274,449		21	274,467
	361	274,386	D8—	13	274,403	D12—	51	274,419		28	274,434		244	274,450		26	274,465
D3—	71	274,387		28	274,404		85	274,398		68	274,435		255	274,451		29	274,466
D4—	01	274,389	D9—	341	274,405		92	274,420		139	274,436	D23—	2	274,452		36	274,468
	10	274,388		418	274,406		110	274,421	D16—	110	274,437		43	274,453		54	274,469
D6—	14	274,390			274,407			274,423		112	274,438		55	274,454			274,470
	26	274,391		423	274,408		147	274,422	D18—	7	274,439			274,455		62	274,471
	73	274,392	D10—	18	274,409		211	274,424	D21—	34	274,440			274,456	D26—	3	274,472
	86	274,393		39	274,410	D13—	15	274,425		56	274,441		57	274,457		60	274,473
	113	274,394		65	274,411	D14—	11	274,426		78	274,442		69	274,458		93	274,474
	151	274,395		66	274,412		53	274,427			274,443		97	274,459		110	274,475
D7—	77	274,396		73	274,413		59	274,428		108	274,444			274,460			274,476
		274,397			274,414		67	274,429		122	274,446		150	274,461			274,477
	152	274,399		106	274,415		105	274,430		142	274,447		163	274,462			274,478
	309	274,400		129	274,416		111	274,431		210	274,445	D24—	2	274,463			

CLASSIFICATION OF PLANTS

P.—	9	5,249		18	5,250		42	5,251									

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Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,455,816
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4,456,288
02 : 4,455,997
04 : 4,455,699
4,456,152
4,456,177
4,456,489
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4,456,952
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4,457,022
05 : 4,456,075
06 : Re.31,615
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23 : 4,455,798
4,455,799
4,456,137
4,456,164
24 : 4,455,696
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4,456,254
4,456,329
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4,456,161
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4,456,550
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4,456,674
4,456,678
4,456,687
4,456,705

CLASSIFICATION OF DESIGNS

D2—	230	274,384
	234	274,385
	361	274,386
D3—	71	274,387
D4—	01	274,389
	10	274,388
D6—	14	274,390
	26	274,391
	73	274,392
	86	274,393
	113	274,394
	151	274,395
D7—	77	274,396
		274,397
	152	274,399
	309	274,400
	360	274,401
	391	274,402
D8—	13	274,403
	28	274,404
D9—	341	274,405
	418	274,406
		274,407
	423	274,408
D10—	18	274,409
	39	274,410
	65	274,411
	66	274,412
	73	274,413
		274,414
	106	274,415
	129	274,416
D11—	44	274,418
	105	274,417
D12—	51	274,419
	85	274,398
	92	274,420
	110	274,421
		274,423
	147	274,422
	211	274,424
D13—	15	274,425
D14—	11	274,426
	53	274,427
	59	274,428
	67	274,429
	105	274,430
	111	274,431
D15—	7	274,433
	14	274,432
	28	274,434
	68	274,435
	139	274,436
D16—	110	274,437
	112	274,438
D18—	7	274,439
D21—	34	274,440
	56	274,441
	78	274,442
		274,443
	108	274,444
	122	274,446
	142	274,447
	210	274,445
	215	274,448
	230	274,449
	244	274,450
	255	274,451
D23—	2	274,452
	43	274,453
	55	274,454
		274,455
		274,456
	57	274,457
	69	274,458
	97	274,459
		274,460
	150	274,461
	163	274,462
D24—	2	274,463
	8	274,464
	21	274,467
	26	274,465
	29	274,466
	36	274,468
	54	274,469
		274,470
	62	274,471
D26—	3	274,472
	60	274,473
	93	274,474
	110	274,475
		274,476
		274,477
		274,478

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P.—	9	5,249
	18	5,250
	42	5,251

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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01 :	4,455,816	4,456,139	4,456,891	4,457,019	4,456,287	22 :	4,456,524
	4,455,943	4,456,158	4,456,912	10 : 4,455,795	4,456,291		4,455,760
	4,456,288	4,456,174	4,456,914	4,456,469	4,456,311		4,455,869
02 :	4,455,997	4,456,176	4,456,915	4,456,613	4,456,326		4,456,149
04 :	4,455,699	4,456,193	4,456,937	4,456,655	4,456,358		4,456,217
	4,456,152	4,456,202	4,456,943	12 : 4,455,720	4,456,487		4,456,322
	4,456,177	4,456,223	4,456,944	4,455,805	4,456,548		4,456,547
	4,456,489	4,456,246	4,456,949	4,455,901	4,456,593		4,456,584
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06 :	Re.31,615	4,456,328	4,456,080	4,456,153	4,456,721	23 :	4,455,798
	4,455,683	4,456,336	4,456,200	4,456,169	4,456,725		4,455,799
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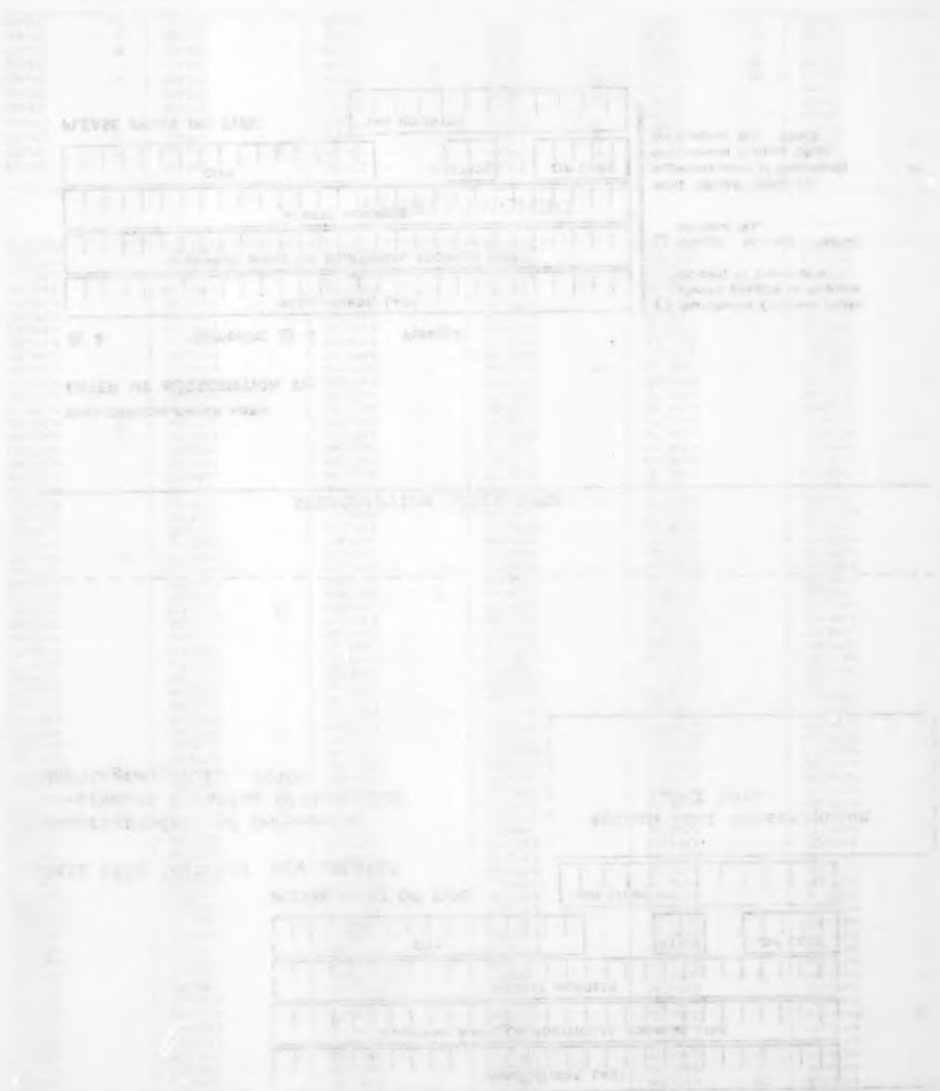
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